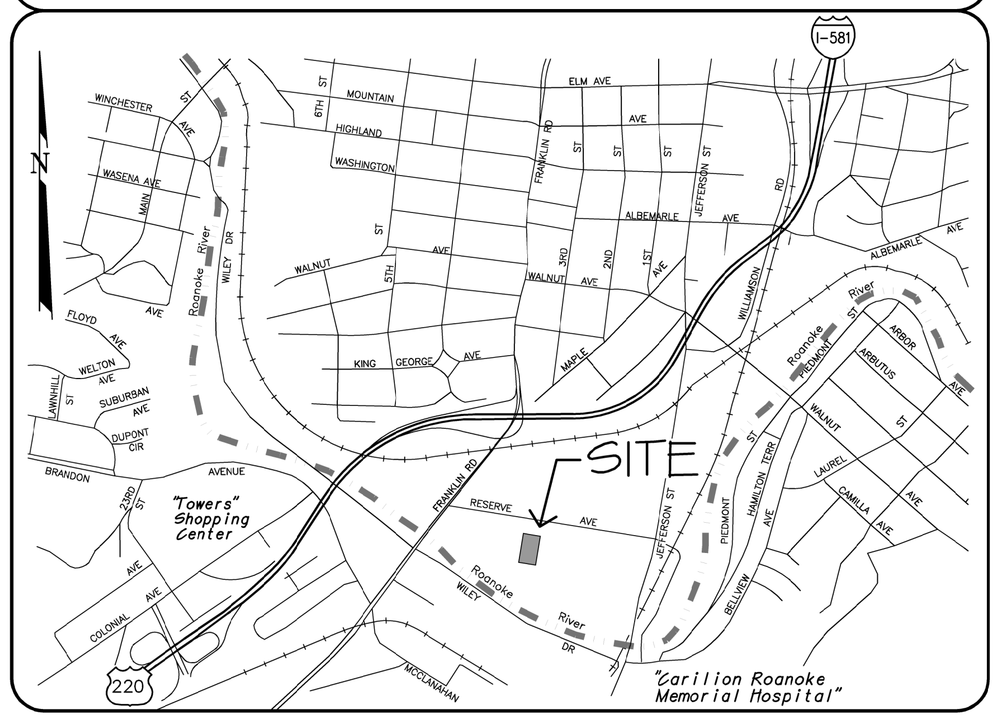
PROJECT LOCATION MAP



LEGEND

ABBREVIATIONS

AHFH	ARROW HEAD TOP OF FIRE HYDRANT	LT	LEFT
APPROX	APPROXIMATE	MH	MANHOLE
ASPH	ASPHALT	MIN	MINIMUM
BC	BOTTOM OF CURB	PROP	PROPOSED
BIT	BITUMINOUS	PUE	PUBLIC UTILITY EASEMENT
BLDG	BUILDING	PVMT	PAVEMENT
BLK	BLOCK	R	RADIUS
BM	BENCHMARK	RT	RIGHT
BW	BOTTOM OF WALL	R/W	RIGHT OF WAY
C&G	CURB & GUTTER	REQD	REQUIRED
CMP	CORRUGATED METAL PIPE	SAN	SANITARY
CONC	CONCRETE	SD	STORM DRAIN
COR	CORNER	SDMH	STORM DRAIN MANHOLE
DI	DROP INLET	SS	SANITARY SEWER
DIA	DIAMETER	SSMH	SANITARY SEWER MANHOLE
EG	EDGE OF GRAVEL	STA	STATION
EP	EDGE OF PAVEMENT	STD	STANDARD
ELEC	ELECTRIC	TC	TOP OF CURB
ELEV	ELEVATION	TEL	TELEPHONE
ENTR	ENTRANCE	TW	TOP OF WALL
EW	ENDWALL	TYP	TYPICAL
EX	EXISTING	VESCH	VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK
FF	FINISHED FLOOR	VDOT	VIRGINIA DEPARTMENT OF TRANSPORTATION
FG	FINISH GRADE		
INV	INVERT	VERT	VERTICAL
HPT	HIGH POINT	YD	YARD
IP	IRON PIN		

SYMBOLS

EXISTING	NEW	
100.5	100.5	SPOT ELEVATION
100	100	CONTOURS
8"SS	8"SS	SANITARY SEWER LINE
4"W	4"W	WATERLINE
8"SD	8"SD	STORM DRAIN
2"G	2"G	GAS LINE
OHE	OHE	OVERHEAD ELECTRIC LINE
OHT	OHT	OVERHEAD TELEPHONE LINE
CATV	CATV	OVERHEAD CABLE TELEVISION LINE
UE UT	UE UT	UNDERGROUND TEL OR ELEC LINE
M	M	WATER OR GAS METER
		VALVE
F.H.	F.H.	FIRE HYDRANT
		MANHOLE
C.O.	C.O.	CLEANOUT
		DROP INLET (CURB OR GRATE)
		UTILITY POLE, GUY & ANCHOR
		DITCH OR SWALE
		CENTERLINE OR BASELINE
		PROPERTY LINE
		SURVEY TRAVERSE POINT
		DIRECT ANGLE
y.l.	Y.L.	YARD LIGHTING
y.h.	Y.H.	YARD HYDRANT
x x		FENCE

ROANOKE

OFFICE OF THE PARKS AND GREENWAY PLANNER
215 CHURCH AVENUE, SW
ROOM 301
ROANOKE, VIRGINIA 24011-1587
PHONE: (540) 853-1166
FAX: (540) 853-1287

PROJECT NAME

TENNIS COURTS RIVERS EDGE PARK-NORTH

TAXMAP #1040202
RESERVE AVENUE
ROANOKE, VA 24016

PLAN NUMBER: _____

CITY PLANNING NUMBER: CP140064

APPROVED FOR CONSTRUCTION

PARKS AND GREENWAY PLANNER	DATE
DIRECTOR OF PARKS AND RECREATION	DATE
ASSISTANT CITY MANAGER	DATE

INDEX OF SHEETS

CONSTRUCTION PROCEDURE REQUIREMENTS

NOTICE: ALL LANDOWNERS, DEVELOPERS AND CONTRACTORS

FAILURE TO COMPLY WITH THE CONSTRUCTION PROCEDURE REQUIREMENTS LISTED BELOW MAY RESULT IN THE COSTLY REMOVAL OF STRUCTURES, TIME DELAYS OR THE ISSUANCE OF A STOP WORK ORDER.

1. RIGHT-OF-WAY EXCAVATION PERMIT –PRIOR TO THE COMMENCEMENT OF ANY DIGGING, ALTERATION OR CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY (STREETS, ALLEYS, PUBLIC EASEMENTS), A RIGHT-OF-WAY EXCAVATION PERMIT SHALL BE APPLIED FOR AND OBTAINED BY THE CONTRACTOR FROM THE CITY OF ROANOKE.

2. LAND DISTURBANCE PERMIT –AN APPROVED EROSION AND SEDIMENT CONTROL PLAN FOR ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST BE SUBMITTED PRIOR TO THE ISSUANCE OF A LAND DISTURBANCE PERMIT.

3. PLANS AND PERMITS –A COPY OF THE PLANS AS APPROVED BY THE CITY (SIGNED BY THE PROPER CITY OFFICIALS) AND ALL PERMITS ISSUED BY THE CITY SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES OF ONGOING CONSTRUCTION.

4. LOCATION OF UTILITIES –THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.

5. CONSTRUCTION ENTRANCE –THE CONTRACTOR SHALL INSTALL AN ADEQUATE CONSTRUCTION ENTRANCE FOR ALL CONSTRUCTION RELATED EGRESS FROM THE SITE. SIZE AND COMPOSITION OF CONSTRUCTION ENTRANCE SHALL BE AS SHOWN ON THE PLANS.

6. STREETS TO REMAIN CLEAN –IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT THE PUBLIC STREET ADJACENT TO THE CONSTRUCTION ENTRANCE REMAINS FREE OF MUD, DIRT, DUST, AND/OR ANY TYPE OF CONSTRUCTION MATERIALS OR LITTER AT ALL TIMES.

7. BARRICADES/DITCHES –THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXCAVATED DITCHES AND SHALL FURNISH AND ENSURE THAT ALL BARRICADES PROPER AND NECESSARY FOR THE SAFETY OF THE PUBLIC ARE IN PLACE.

8. SEWER AND PAVEMENT REPLACEMENT –CONSTRUCTION OF SANITARY SEWERS AND THE REPLACEMENT OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPROVED STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE AND THE WESTERN VIRGINIA WATER AUTHORITY.

9. APPROVED PLANS/CONSTRUCTION CHANGES –ANY CHANGE OR VARIATION FROM CONSTRUCTION DESIGN AS SHOWN ON THE OFFICIALLY APPROVED PLANS SHALL BE APPROVED BY THE EROSION AND SEDIMENT CONTROL AGENT PRIOR TO SAID CHANGES OR VARIATION IN CONSTRUCTION BEING MADE.

10. FINAL ACCEPTANCE/CITY –THE OWNER OR DEVELOPER SHALL FURNISH THE CITY OF ROANOKE'S PLANNING BUILDING AND DEVELOPMENT DEPARTMENT WITH A FIELD SURVEYED FINAL CORRECT SET OF AS-BUILT PLANS OF THE NEWLY CONSTRUCTED STORM DRAIN AND/OR STORMWATER MANAGEMENT FACILITIES PRIOR TO FINAL ACCEPTANCE AND ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE CITY. AS-BUILT PLANS SHALL BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NAD 83, IN THE FORM OF 1-PAPER COPY AND 1-DIGITAL AUTOCAD FILE.

CONSULTING ENGINEERS

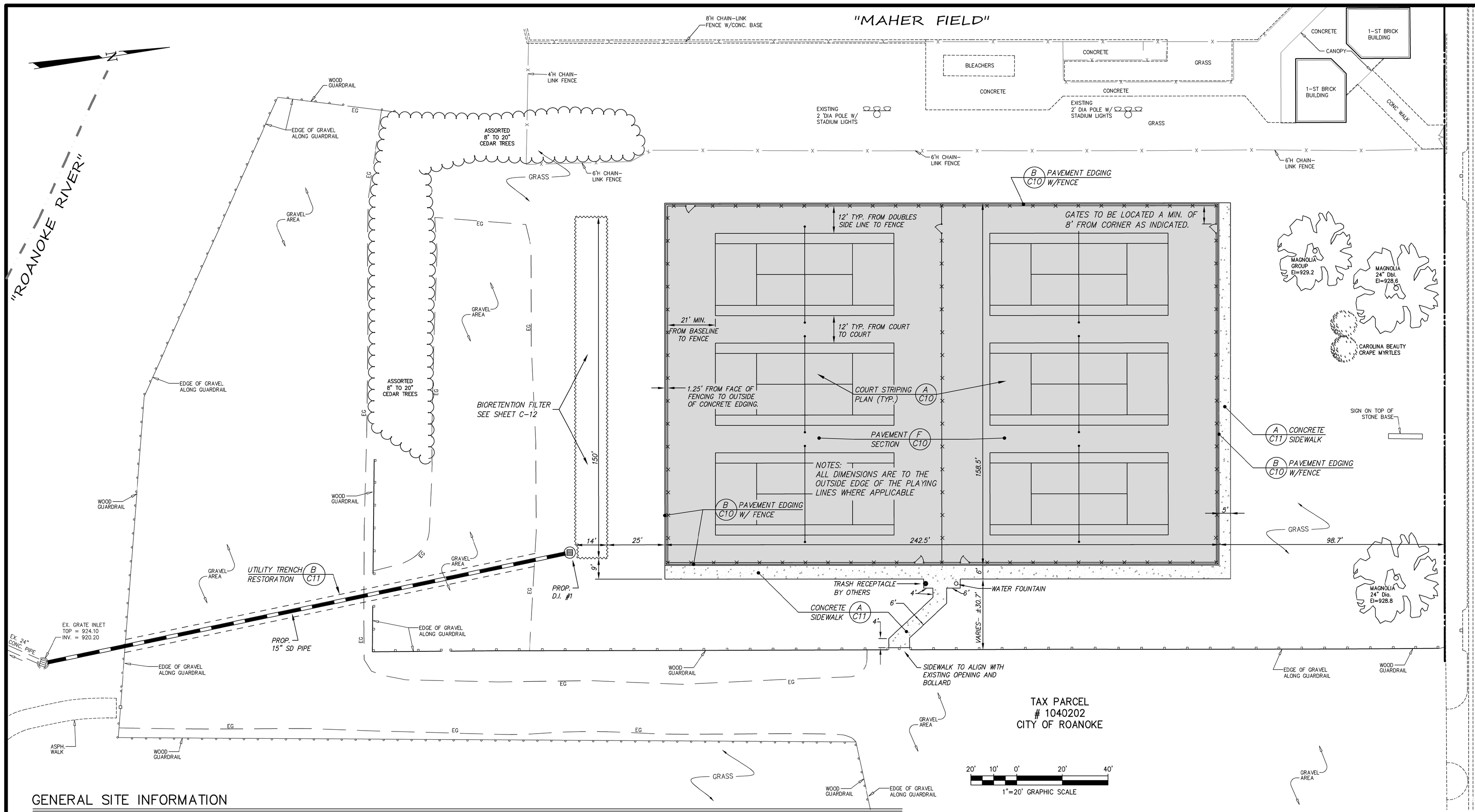
CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM

Designed By: J.V.Judy
Checked By: F.B.Caldwell
Revised: 5/29/15
W.O. # 14-0061
N.B. # RKE. CITY #10

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

SHEET
C-1

TENNIS COURTS – RIVERS EDGE PARK-NORTH



GENERAL SITE INFORMATION

TAX PARCEL: 1040202

OWNER: CITY OF ROANOKE MAHER FIELDS
215 RESERVE AVENUE, SW
ROANOKE, VIRGINIA

ZONING: INPUD

CURRENT USE: PARK & RECREATION AREAS
451-COMM/INDUST-CITY

PROPOSED USE OF NEW CONSTRUCTION: RECREATION, OUTDOOR TENNIS COURT FACILITIES

LEGAL DESCRIPTION: PLEASANT AVENUE & ROANOKE RIVER
ROANOKE INDUSTRIAL & AGRICULTURAL ASSN.
D.B. 664, Pg. 54

ACREAGE / SF: 31.889 Ac. / 1,389,080 sf
FRONTAGE: 570.8 l.f.

YEAR CONSTRUCTED: 1996 - EXISTING FIELD HOUSES
BUILDING AREA: 1,794 sf

FLOODPLAIN INFORMATION: Property lies completely within the Floodway and Zone 'AE' as identified on FEMA Flood Insurance Rate Map, Panel 51161c0164g, Revised September 28, 2007. NO NEW FILL MATERIAL IS PROPOSED WITHIN THE FLOODWAY

MAXIMUM IMPERVIOUS SURFACE AREA RATIO: (EXCLUDING RIVER) 80%
EXISTING IMPERVIOUS AREA RATIO: ±13%
PROPOSED IMPERVIOUS AREA RATIO: ±16%

PARKING PROVIDED: NO ADDITIONAL PARKING IS PROPOSED. EXISTING FACILITIES ON THE SUBJECT PROPERTY INCLUDE 41 PAVED SPACES (incl. 1 Handicap) and ±300 ON THE GRAVEL AREAS.

SITE LIGHTING: Existing Facilities are currently lighted and NO NEW FIXTURES ARE PROPOSED AT THIS TIME.

TREE CANOPY SEE CALCULATIONS ON THE LANDSCAPE PLAN SHEET C-9

THE OWNERS OF THE SUBJECT PROPERTY HEREBY ACKNOWLEDGE THAT THE PURPOSE OF THIS PLAN IS TO CONSTRUCT A TENNIS COURT FACILITY ONLY AND DOES NOT INCLUDE ANY BUILDINGS.

1. THE PROJECT WILL REQUIRE A SEPARATE PERMIT FOR THE INSTALLATION OF THE PROPOSED CHAIN-LINK FENCE.

2. THIS PROJECT DOES NOT INCLUDE ANY RELOCATION OR INSTALLATION OF ANY MECHANICAL EQUIPMENT FOR THE EXISTING BUILDINGS.

3. THIS PROJECT DOES NOT INCLUDE ANY RELOCATION OR INSTALLATION OF ANY SOLID WASTE DISPOSAL DUMPSTERS.

4. THIS PROJECT DOES NOT INCLUDE ANY RELOCATION OR INSTALLATION OF ANY BUILDING UTILITY SERVICE LINES OR LATERALS, (I.E. ELECTRIC, TELEPHONE, ETC.)

5. THIS PROJECT DOES NOT INCLUDE ANY RELOCATION OR INSTALLATION OF ANY OUTDOOR LIGHTING. (NOTE UNDERGROUND CONDUITS ARE BEING PROVIDED TO ALLOW FUTURE SERVICE EXTENSION TO THE FUTURE LIGHTS INDICATED.)

ENGINEER'S NOTES

CALDWELL WHITE ASSOCIATES ASSUMES NO RESPONSIBILITY FOR ADEQUACY OF PLANS OR FOR INFORMATION ON PLANS UNTIL SUCH PLANS HAVE BEEN APPROVED BY THE REQUIRED PUBLIC AGENCIES.

ANY WORK COMMENCED ON A PROJECT PRIOR TO PLAN APPROVAL IS AT THE SOLE RISK OF THE OWNER.

CALDWELL WHITE ASSOCIATES DOES NOT GUARANTEE THE COMPLETION OR QUALITY OF PERFORMANCE OF THE CONTRACTS BY CONTRACTORS OR OTHER THIRD PARTIES.

SOURCE OF TOPOGRAPHIC MAPPING IS A FIELD SURVEY BY CALDWELL WHITE ASSOCIATES DATED: AUGUST, 2014

BOUNDARY DATA SHOWN IS FROM FIELD SURVEY BY CALDWELL WHITE ASSOCIATES DATED: AUGUST, 2014

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY SITE CONDITIONS THAT WILL AFFECT THE INSTALLATION OF PROPOSED IMPROVEMENTS.

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

DIMENSIONAL PLAN

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK - NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	1"=20'
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

CWA
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ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM

FEMA INFORMATIOM

PROPERTY LIES COMPLETELY WITHIN THE FLOODWAY AND ZONE 'AE' AS IDENTIFIED ON FEMA FLOOD INSURANCE RATE MAP, PANEL 51161C0164G, REVISED SEPTEMBER 28, 2007.

NO NEW FILL MATERIAL IS PROPOSED WITHIN THE LIMITS OF THE FLOODWAY.

"ROANOKE RIVER"

"MAHER FIELD"

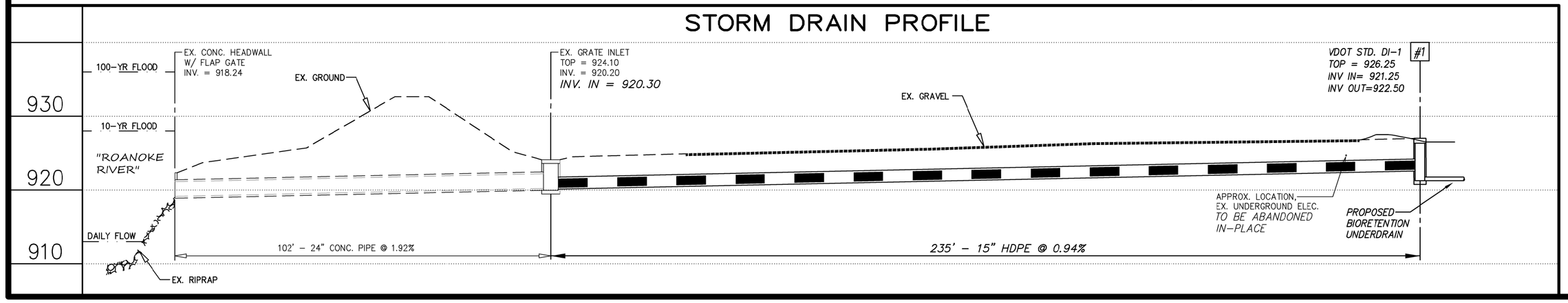
RESERVE AVENUE, S.W.
VARIABLE WIDTH R/W

8'H CHAIN-LINK FENCE W/CONC. BASE
4'H CHAIN-LINK FENCE
6'H CHAIN-LINK FENCE
FEMA FLOODWAY
FEMA FLOOD ZONE AE
WOOD GUARDRAIL
EDGE OF GRAVEL ALONG GUARDRAIL
GRAVEL AREA
GRASS
ASSORTED 8" TO 20" CEDAR TREES
EX. S.S.MH TOP = 927.85 INV. = 922.45
EX. ELEC. SERV. BOX (TYP)
EX. ELEC. SPLITTER BOX
EXISTING 2 'DIA POLE W/ STADIUM LIGHTS
EX. FOUNTAIN
CONCRETE
BLEACHERS
CANOPY
1-ST BRICK BUILDING
EXISTING 2' DIA POLE W/ STADIUM LIGHTS
EX. YH
EX. WV
EX. WMH TOP=930.46
EX. SSSC⊘
CONC. WALK
EX. S.S.MH TOP = 929.40 INV. = 926.58
5' WIDE BERM TOP=927.5
FG = 927.55
GRAVEL SPILLWAY
FG=929.46
FG = 929.56
PROPOSED OBSEVATION WELL, TYP. of 3, SEE DETAIL, SHT C-12
3' WIDE BERM TOP=927.0
PROPOSED FILTER MEDIA
NOTE: EXISTING UNDERGROUND ELECTRICAL LINE INDICATED HAS BEEN ABANDONED IN-PLACE.
5' WIDE GRASS FILTER STRIP
PRE-TREATMENT CELL
BIORETENTION FILTER SEE SHT. C-12
#1 PROP. VDOT STD. DI-1 TOP = 926.25
6" UNDERDRAIN SLOPE= 0.0% C.O.'s REQD @ MIN. 100' INTERVALS C.O.'s SHALL HAVE A VENTED CAP.
150'
14'
5'
WATER FOUNTAIN C C11
928.37
928.50
FRU VALVE
DRYWELL
1/2"W SUPPLY LINE
927.43
G.C. SHALL VERIFY SIZE AND LOCATION OF EX. WATERLINE CONNECTION TO EX. LINE SHALL BE WITH A 1/2" TAPPING SADDLE. WORK TO BE PERMITTED BY G.C. AND INSPECTED BY THE CITY OF ROANOKE.
STUB UP AND CAP CONDUIT
EX. ELEC. SERV. PANEL
EX. GRATE INLET TOP = 924.10 INV. = 920.20 INV. IN=920.30
EX. 24" CONC. PIPE
PROPOSED 15" HDPE PIPE. SEE STORM DRAIN PROFILE THIS SHEET.
MAGNOLIA GROUP El=929.2
MAGNOLIA 24" Dbl. El=928.6
CAROLINA BEAUTY CRAPE MYRTLES
SIGN ON TOP OF STONE BASE
MAGNOLIA 24" Dia. El=928.8
WATER METER
W. LAT.
5"HYD
FIRE HYD.
EX. WV El=928.7
ASPH. WALK
66"SS
BM

TAX PARCEL
1040202
CITY OF ROANOKE

BENCHMARK:
RAILROAD SPIKE IN POWER POLE
ELEVATION = 929.21

STORM DRAIN PROFILE



UNDERGROUND ELECTRIC

THE UNDERGROUND LINE SHALL BE INSTALLED AS INDICATED TO PROVIDE ELECTRIC SERVICE TO THE FUTURE LIGHT POLES.

1. THE LINE SHALL BE A MIN. 3" DIAMETER SCHEDULE 40 PVC PIPE W/PULL STRINGS.
2. MINIMUM DEPTH OF COVER SHALL BE 24"
3. ALL TEES SHALL BE 3"x3".
4. ALL 90-DEGREE ELBOWS SHALL BE LONG-SWEEP.
5. VDOT STD. JB-S1 JUNCTION BOXES SHALL BE INSTALLED WHERE INDICATED.
6. STUBS TO THE POLE LOCATIONS SHALL BE STAKED BY THE ENGINEER, LOCATIONS SHALL BE COORDINATED WITH THE MOST CURRENT LIGHTING PLANS PROVIDED BY THE DEPARTMENT OF PARKS AND RECREATION.
7. LINES SHALL BE INSTALLED PRIOR TO INSTALLATION OF ANY CONCRETE WORK FOR THE FENCING, COURT OR SIDEWALKS.
8. DETECTABLE WARNING TAPE SHALL BE INSTALLED A MINIMUM OF 12 INCHES ABOVE THE CONDUIT AND A MINIMUM OF 6 INCHES BELOW FINAL GRADE.

20' 10' 0' 20' 40'
1"=20' GRAPHIC SCALE

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

GRADING & UTILITY PLAN

CITY OF ROANOKE

DEPARTMENT OF PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK - NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
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Checked:	F.B.C.
Revised:	5/29/15
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"MAHER FIELD"

"ROANOKE RIVER"

RESERVE AVENUE, S.W.
VARIABLE WIDTH R/W

8'H CHAIN-LINK FENCE W/CONC. BASE
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EDGE OF GRAVEL ALONG GUARDRAIL
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CAROLINA BEAUTY CRAPE MYRTLES
SIGN ON TOP OF STONE BASE
EX. GRATE INLET TOP = 924.10 INV. = 920.20
EX. 24" CONC. PIPE
ASPH. WALK

LIMITS OF DISTURBANCE

PROPOSED BIORETENTION FILTER AREA, SEE SPECIAL NOTES ON SHEET C-12, REGARDING CONSTRUCTION SEQUENCING

BOTTOM EL=924.0

15'

SODDING SHALL BE PROVIDED AS INDICATED ON SHEET C-9. SEE NOTES REGARDING INSTALLATION AND TIMING AS RELATED WITH THE BIORETENTION FILTER

WET STORAGE ELEVS. = 924.0 to 925.0
DRY STORAGE ELEVS. = 925.0 to 926.0
OVERFLOW ELEV. = 926.0
G.C. SHALL UTILIZE A DEWATERING STRUCTURE, "DS" AS REQUIRED TO DRAIN THE TRAP AS NEEDED OR PRIOR TO CONVERTING TO THE BIORETENTION FILTER

G.C. SHALL RETAIN A SUFFICIENT QUANTITY OF NATIVE TOPSOIL ON-SITE AS REQUIRED FOR STABILIZING AREAS NOT RECEIVING SOD OR IMPERVIOUS COVER.

NOTE:
G.C. SHALL UTILITIZE THE EXISTING GRAVEL AREAS AS AN ENTRANCE CORRIDOR AND AS A STAGING AREA. IF TRACKING OF SEDIMENT OR MUD BEGINS TO APPEAR ON THE ADJOINING PUBLIC ROADWAYS, THE SOIL MATERIAL MUST BE REMOVED IMMEDIATELY AND A PROPER CONSTRUCTION ENTRANCE SHALL BE INSTALLED AND MAINTAINED FOR THE REMAINDER OF THE CONSTRUCTION.

DD SF TS PS MU SO ST DS IP TO

20' 10' 0' 20' 40'
1"=20' GRAPHIC SCALE

TAX PARCEL
1040202
CITY OF ROANOKE

MODIFIED VIRGINIA CODING SYSTEM for Erosion and Sediment Control Practices

REFER TO SHEET C-8 FOR DETAILS OF IMPLEMENTED MEASURES

NO.	TITLE	KEY	SYMBOL
3.05	SILT FENCE	SF	********
3.07	STORM DRAIN INLET PROTECTION	IP	
3.09	TEMPORARY DIVERSION DIKE	DD	
3.13	TEMPORARY SEDIMENT TRAP	ST	
3.26	DEWATERING STRUCTURE	DS	
3.31	TEMPORARY SEEDING	TS	TS
3.32	PERMANENT SEEDING	PS	PS
3.33	SODDING	SO	SO
3.35	MULCHING	MU	MU

AREA OF DISTURBANCE - 1.42 ACRES
LIMITS OF DISTURBANCE -

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

EROSION & SEDIMENT CONTROL PLAN

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK - NORTH
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STATE IMPOSED MINIMUM STANDARDS – 9VAC25–840–40

THE FOLLOWING STANDARDS ARE TO BE PROVIDED OR ADDRESSED ON EVERY DEVELOPMENT PROJECT EXCEEDING 5000 S.F. IN AREA OF DISTURBANCE. THESE STANDARDS ARE CONSIDERED A MINIMUM AND MAY REQUIRE ADDITIONAL MEASURES AS DEEMED NECESSARY BY THE LOCAL VIRGINIA EROSION & SEDIMENT CONTROL PROGRAM AUTHORITY OR THE CONSULTING ENGINEER.

CRITERIA, TECHNIQUE OR METHOD	REMARKS
1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.	SELF–EXPLANATORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD. TEMPORARY & PERMANENT SEEDING SPECIFICATIONS ARE PROVIDED ON SHEET C–8
2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.	SELF–EXPLANATORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD. SOIL STOCKPILING IS INDICATED ON SHEET C–4 AND SHALL BE PROTECTED WITH SILT FENCING.
3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND–DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
5. STABILIZATION METHODS SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN. A) THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES. B) SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25–YEAR STORM OF 24–HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.	THE PROPOSED SEDIMENT TRAP HAS BEEN DESIGNED TO PROVIDE ADDITIONAL STORAGE VOLUME THEN THE MINIMUM REQUIRED AND CALCULATIONS PROVIED TO INSURE THE STABILITY DURING A 25–YEAR STORM.
7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZATION MEASURES UNTIL THE PROBLEM IS CORRECTED.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.	THE ONLY CUT SLOPES PROPOSED ARE THOSE LOCATED WITHIN AND PART–OF THE PROPOSED SEDIEMNT TRAP.
9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.	THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD AND REPORT ANY EVIDENCE TO THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY, ADDITIONAL MEASURES MAY BE REQUIRED.
10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT–LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.	THE PROPOSED STORM PIPE WILL ONLY BE ACCEPTING RUN–OFF THAT IS BEING RELEASED BY THE SEDIMENT TRAP OR BIORETENTION FILTER.
11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.	NOT APPLICABLE. THE EXISTING RECEIVING CHANNEL HAS BBEN PREVIOUSLY PROTECTED WITH RIPRAP LINING.
12. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NON–ERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NON–ERODIBLE COVER MATERIALS.	NOT APPLICABLE. NO LIVE WATERCOURSES ARE LOCATED WITHIN THE LIMITS OF DISTURBANCE.
13. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX–MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NON–ERODIBLE MATERIAL SHALL BE PROVIDED.	NOT APPLICABLE. NO LIVE WATERCOURSES ARE LOCATED WITHIN THE LIMITS OF DISTURBANCE.
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.	NOT APPLICABLE. NO LIVE WATERCOURSES ARE LOCATED WITHIN THE LIMITS OF DISTURBANCE.
15. THE BEDS AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	NOT APPLICABLE. NO LIVE WATERCOURSES ARE LOCATED WITHIN THE LIMITS OF DISTURBANCE.
16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA: A) NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME. B) EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. C) EFFLUENT FROM DE–WATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF–SITE PROPERTY. D) MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION. E) RE–STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER. F) APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND–DISTURBING ACTIVITIES.	SELF–EXPLANTORY. THE RLD SHALL BE RESPONSIBLE TO INSURE COMPLIANCE WITH THIS STANDARD.
18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.	SELF–EXPLANTORY. PER REQUIREMENTS OF THE CITY OF ROANOKE IT SHALL BE NOTED THAT NO EROSION CONTROL STRUCTURAL MEASURES INDICATED ON THESE PLANS ARE TO BE REMOVED WITHOUT APPROVAL FROM THE CITY.
19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24–HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN–MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN–MADE CHANNELS.	ENGINEERING CALCULATIONS, DATED 11/18/2014 HAVE BEEN SUBMITTED AND APPROVED BY THE VESCP AUTHORITY.
A) CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN–MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.	..... ALL FORMS OF CONCENTRATED RUNOFF FLOW INTO AN ADEQUATE CHANNEL – ROANOKE RIVER.
B) ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER: (1) THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR (2) (a) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO–YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS. (b) ALL PREVIOUSLY CONSTRUCTED MAN–MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN–YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO–YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND (c) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN–YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.	..... B–1 CRITERIA MET
C) IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN–MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL: (1) IMPROVE THE CHANNELS TO A CONDITION WHERE A TEN–YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO–YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR (2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN–YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR (3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE–DEVELOPMENT PEAK RUNOFF RATE FROM A TWO–YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE–DEVELOPMENT PEAK RUNOFF RATE FROM A TEN–YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN–MADE CHANNEL; OR (4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION.	..... NOT APPLICABLE
D) THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.	..... NOT APPLICABLE
E) ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.	..... SEE REFERENCED ENGINEERING CALCULATIONS
F) IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.	..... NOT APPLICABLE
G) OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.	..... NOT APPLICABLE
H) ALL ON–SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.	..... NEW PIPE SYSTEM DESIGNED PER APPLICABLE STDS.
I) INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.	..... NOT APPLICABLE
J) IN APPLYING THESE STORMWATER MANAGEMENT CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.	..... SUBJECT PROPERTY IS A PARK, AND ULTIMATE LAYOUTS FOR REMAINING PROPERTY HAVE NOT BEEN PREPARED.
K) ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.	..... NOT APPLICABLE
L) ANY PLAN APPROVED PRIOR TO JULY 1, 2014 THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN–MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN–MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO (1) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (2) DETAIN AND RELEASE OVER A 24–HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24–HOUR STORM; AND (3) REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2 AND 10–YEAR, 24–HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FROM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN–MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO LOC #62.1–44.15:54 OR #62.1–44.15:65 OF THE ACT.	..... NOT APPLICABLE
M) FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF LOC #62.1–44.15:52 OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUALITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (LOC #62.1–14.15:24 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND–DISTURBING ACTIVITIES ARE IN ACCORDANCE WITH 9VAC25–870–48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATIONS.	..... STORMWATER QUALITY MEASURES HAVE BEEN PROVIDED FOR THE PROPOSED IMPERVIOUS AREAS TO REDUCE THE POLLUTANT LOADS TO VSMP CRITERIA.
N) COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25–870–66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATIONS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF SUBDIVISION 19 OF THIS SUBSECTION.	..... ALL POINTS OF CONCENTRATED RUNOFF HAVE BEEN ANALYZED TO A POINT OF ADEQUACY BASED ON THE VSMP CRITERIA.

SOIL EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS TO CONSTRUCT A SIX (6) COURT TENNIS FACILITY ADJACENT TO EXISTING GRAVEL PARKING LOTS. THE PROJECT CONSISTS OF REMOVING TOPSOIL, MINOR GRADING TO FACILITATE THE COURTS REQUIRED SLOPES, AND A BIORETENTION FILTER AREA. THE PROJECT WILL ALSO REQUIRE THE INSTALLATION OF A STORM DRAIN SYSTEM TO TIE INTO THE EXISTING PIPE UNDER THE FLOOD REDUCTION TRAINING WALLS.

EXISTING SITE CONDITIONS: THE LIMITS OF DISTURBANCE IS ALONG THE EASTERN SIDE OF THE EXISTING BASEBALL FIELD KNOWN AS "MAHER FIELD". IT IS CURRENTLY VEGETATED IN GRASS. NO TREES OR SHRUBS ARE LOCATED WITHIN THE LIMITS OF DISTURBANCE. OVER 90% OF THE SUBJECT AREA DRAINS TOWARD THE SOUTH AND DISCHARGES INTO AN EXISTING YARD INLET AND PIPE SYSTEM. THIS SYSTEM DISCHARGES DIRECTLY INTO THE ROANOKE RIVER. THE REMAINDER OF THE SITE SHEET FLOWS TO THE NORTH AND INTO THE EXISTING CURB SYSTEM ALONG RESERVE AVENUE. THIS CURBING FLOWS INTO ANOTHER INLET/PIPE SYSTEM THAT FLOWS THROUGH THE PARK, PARALLEL WITH JEFFERSON STREET AND DISCHARGES INTO THE ROANOKE RIVER. THERE ARE CURRENTLY NO KNOWN EROSION OR DRAINAGE PROBLEMS RELATED TO THIS PORTION OF THE PROPERTY.

ADJACENT PROPERTY: THE LIMITS OF DISTURBANCE IS LOCATED IN THE RIVERS EDGE PARK–NORTH. THIS PROPERTY IS OWNED BY THE CITY OF ROANOKE AND IS LOCATED ALONG THE 200 BLOCK OF RESERVE AVENUE, SW.
A. THE WESTERN PROPERTY LINE IS BOUNDED BY PROPERTY OWNED BY THE CITY OF ROANOKE AND CONTAINS A VACANT BUILDING AND PARKING AREA.
B. THE NORTHERN PROPERTY LINE IS BOUNDED BY THE PUBLIC RIGHT–OF–WAY KNOWN AS RESERVE AVENUE, SW. ACROSS THE R.O.W. ARE PROPERTIES BEING UTILIZED AS A MOTEL AND PARKING GARAGES, ETC.
C. THE EASTERN PROPERTY LINE IS BOUNDED BY THE PUBLIC RIGHT–OF–WAY KNOWN AS JEFFERSON STREET.
D. THE SOUTHERN PROPERTY LINE IS BOUNDED BY THE ROANOKE RIVER AND THE PROPERTY OWNED BY THE CITY OF ROANOKE. ACROSS THE RIVER IS RIVERS EDGE PARK–SOUTH.

CRITICAL AREAS: THERE ARE NO CRITICAL AREAS ANTICIPATED DUE THE PROPOSED STORM PIPE EXTENSION AND LOCATION/DESIGN OF THE TEMPORARY SEDIMENT TRAP.

OFF–SITE AREAS: THE CONTRACTOR WILL BE REQUIRED TO PROVIDE, TO THE CITY OF ROANOKE:
A. THE LOCATION OF ANY OFF–SITE BORROW AREAS
B. THE LOCATION OF ANY OFF–SITE AREAS WHERE EXCESS EXCAVATED MATERIAL AND/OR TOPSOIL WILL BE DISPOSED.

SOILS: SOILS IN THIS AREA ARE IDENTIFIED BY THE "SOIL SURVEY OF ROANOKE COUNTY AND THE CITIES OF ROANOKE AND SALEM, AS 44A (Speedwell–Urban land complex).

MAP UNIT SETTING:
National map unit symbol: kgfd
Elevation: 1,200 to 2,600 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost–free period: 171 to 207 days
Farmland classification: Not prime farmland

MAP UNIT COMPOSITION:
Speedwell and similar soils: 40 percent
Urban land: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

DESCRIPTION OF SPEEDWELL:
SETTING:
Landform: Flood plains
Landform position (three–dimensional): Tread
Down–slope shape: Linear
Across–slope shape: Linear
Parent material: Alluvium
TYPICAL PROFILE:
H1 – 0 to 17 inches: loam
H2 – 17 to 45 inches: loam
H3 – 45 to 62 inches: loam
PROPERTIES AND QUALITIES:
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.0 inches)
INTERPRETIVE GROUPS:
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B

DESCRIPTION OF URBAN LAND:
PROPERTIES AND QUALITIES–
Slope: 0 to 2 percent
Depth to restrictive feature: 10 inches to
INTERPRETIVE GROUPS–
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
MINOR COMPONENTS–
Clubcaf
Percent of map unit: 5 percent
Landform: Depressions on flood plains
Landform position (three–dimensional): Tread
Down–slope shape: Concave, linear
Across–slope shape: Concave, linear

A RECENT REPORT PROVIDED BY GEOTECHNICS, INC., DATED 1 NOVEMBER 2014 IDENTIFY THE EXISTING SOILS AS 0.2 THICKNESS OF TOPSOIL, UNDER–LAYED BY A REDDISH–TAN SILTY CLAY. ALLUVIUM MATERIAL WAS DESCRIBED AS BROWN SILTY FINE SAND. THE UNDERLAYING SOIL DOES NOT PROVIDE ADEQUATE INFILTRATION RATES AND THERE–FORE UNDERDRAINS WILL BE REQUIRED FOR ANY BIORETENTION DESIGNS. THE ENTIRE REPORT CAN BE FOUND AS APPENDIX B, OF THE ENGINEERING CALCULATIONS.

EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES INDICATED HEREON SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", THIRD EDITION.
1. SILT FENCING INSTALLED ALONG THE LOWER EDGE OF DISTURBANCE WILL BE THE FIRST STEP IN PROTECTING THE ADJOINING PROPERTIES AND FOR CONTROLING ANY SEDIMENT–LADEN RUNOFF FROM LEAVING THE SITE.
2. TEMPORARY DIVERSION DIKES SHALL BE INSTALLED ALONG THE LOWER PORTION OF THE DISTURBANCE AS INDICATED TO DIRECT ANY SEDIMENT–LADEN RUNOFF TO THE SEDIMENT TRAP. IN CONJUCTION WITH THIS WORK, THE G.C. SHALL INSTALL THE PROPOSED STORM PIPE SYSTEM AND BEGIN EXCAVATION FOR THE SEDIMENT TRAP.
3. AFTER THE CONTROL DEVICES ARE FOUND TO BE FUNCTIONAL, THE CONTRACTOR MAY THEN PROCEED WITH FINAL GRADING AND INSTALLATION OF THE COURTS BASE AND AGGREGATE BASE COURSES.
4. ALL EXISTING DENUDED AREAS LOCATED WITHIN THE LIMITS OF DISTURBANCE SHALL RECEIVE PERMANENT SEEDING WITHIN SEVEN (7) DAYS AFTER FINAL GRADING, AND SHALL BE IN STRICT ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", THIRD EDITION.

MAINTENANCE: ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE VAR10 REQUIREMENTS FOUND ON SHEET C–6 AND THOSE ASSOCIATED WITH THE SPECIFIC DETAIL FOUND ON SHEET C–8.

GENERAL COMMENTS:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES.
2. NO WORK SHALL PROCEED ON SITE UNTIL THE PROPER AUTHORIZATION OR PERMIT HAS BEEN OBTAINED FROM THE CITY OF ROANOKE.
3. PER REQUIREMENTS OF THE CITY OF ROANOKE IT SHALL BE NOTED THAT NO EROSION CONTROL STRUCTURAL MEASURES INDICATED ON THESE PLANS ARE TO BE REMOVED WITHOUT APPROVAL FROM THE CITY.

GENERAL EROSION & SEDIMENT CONTROL NOTES:

(AS TAKEN FROM TABLE 6–1 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK)

ES–1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 4VAC50–30 EROSION AND SEDIMENT CONTROL REGULATIONS

ES–2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE–CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

ES–3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.

ES–4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

ES–5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF–SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

ES–6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.

ES–7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES–8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.

ES–9: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUN–OFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

ACRONYMS

BMP	BEST MANAGEMENT PRACTICE
COV	CODE OF VIRGINIA
DEQ	DEPARTMENT OF ENVIRONMENT QUALITY
EPA	ENVIRONMENTAL PROTECTION AGENCY
ESC	EROSION & SEDIMENT CONTROL
RLD	RESPONSIBLE LAND DISTURBER (REGISTERED W/DEQ)
SWM	STORMWATER MANAGEMENT
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
VAC	VIRGINIA ADMINISTRATIVE CODE
VESCP	VIRGINIA EROSION & SEDIMENT CONTROL PROGRAM
VPDES	VIRGINIA POLLUTION DISCHARGE ELIMINATION SYSTEM
VSMP	VIRGINIA STORMWATER MANAGEMENT PROGRAM

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL,III
LIC. NO. 9184
29 MAY 15
PROFESSIONAL ENGINEER

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	N/A
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14–0061

VIRGINIA E.S.C. REGULATIONS
CITY OF ROANOKE
DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK – NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366–3400
EMAIL: CWAROANOKE@AOL.COM

THE FOLLOWING ARE REQUIREMENTS AND DOCUMENTATION PER the GENERAL PERMIT No. VAR10, GENERAL VPDES PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES, PART II, STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. GENERAL INFORMATION:

a. Registration Statement: *A SIGNED COPY OF THE REGISTRATION STATEMENT, VAR10, SHALL BE KEPT WITH THESE DOCUMENTS AND ANY OTHER ASSOCIATED PLANS, CALCULATIONS, LOG BOOK, ETC.*

b. Notice of Coverage: *UPON RECEIPT FROM THE COMMONWEALTH OF VIRGINIA, A COPY OF THE NOTICE OF COVERAGE SHALL BE KEPT WITH THESE DOCUMENTS AND ANY OTHER ASSOCIATED PLANS, CALCULATIONS, LOG BOOK, ETC.*

c. VPDES Permit: *UPON RECEIPT FROM THE COMMONWEALTH OF VIRGINIA, A COPY OF THE GENERAL VPDES PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES SHALL BE KEPT WITH THESE DOCUMENTS AND ANY OTHER ASSOCIATED PLANS, CALCULATIONS, LOG BOOK, ETC.*

d. Nature of the Construction Activity: *REFER TO THE SOIL EROSION CONTROL NARRATIVE, SHEET C-5.*

e. Legible Site Plan:
(1) *REFER TO SHEET C-3 FOR THE POST-DEVELOPMENT GRADING PLAN. DIRECTION OF STORMWATER FLOW IS PERPENDICULAR TO THE PROPOSED CONTOURS.*
(2) *REFER TO SHEET C-4 FOR THE LIMITS OF LAND DISTURBANCE.*
(3) *REFER TO SHEET C-4 FOR THE LOCATIONS OF ALL PROPOSED EROSION & SEDIMENT CONTROL MEASURES.*
(4) *THERE ARE NO SURFACE WATERS LOCATED WITHIN THE LIMITS OF LAND DISTURBANCE.*
(5) *THE LOCATION OF CONCENTRATED STORMWATER CREATED FROM THIS PROJECT DISCHARGE INTO AN EXISTING PUBLIC STORM PIPE SYSTEM WHICH DISCHARGES DIRECTLY INTO THE ROANOKE RIVER. DOCUMENTATION PROVIDED IN THE ENGINEERING CALCULATIONS INSURES THE ADEQUACY OF THESE SYSTEMS.*
(6) *REFER TO SHEET C-7 FOR A POLLUTION PREVENTION PLAN.*
(7) *THE OPERATOR AND OR THE RESPONSIBLE LAND DISTURBER MAY, AT THEIR DISCRETION INSTALL A RAIN-GUAGE TO IDENTIFY MEASURABLE STORM EVENTS FOR INSPECTION PURPOSES. THE RAIN GAUGE LOCATION SHALL BE MARKED ON THE CONSTRUCTION PLANS.*

2. EROSION AND SEDIMENT CONTROL PLAN:

a. Plan Approval: *THE EROSION AND SEDIMENT CONTROL PLAN PROVIDED ON SHEET C-4, ALONG WITH THE APPLICABLE DETAILS, NOTES AND SPECIFICATIONS HAVE BEEN PREPARED IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL REGULATIONS (9VAC25-840) AND SUBSEQUENTLY APPROVED BY THE LOCAL VESCP*

b. Maintenance Responsibilities: *ALL CONTROL MEASURES MUST BE PROPERLY MAINTAINED IN EFFECTIVE OPERATING CONDITION IN ACCORDANCE WITH GOOD ENGINEERING PRACTICES AND, WHERE APPLICABLE, MANUFACTURER SPECIFICATIONS. IF SITE INSPECTIONS IDENTIFY CONTROL MEASURES THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED AS SOON AS PRACTICABLE TO MAINTAIN THE CONTINUED EFFECTIVENESS OF THE CONTROL MEASURES.*

c. Plan Implementation:
(1) *THE DESIGN OF THE PROJECT, HAS UTILIZED ACCEPTABLE VESCP METHODS TO CONTROL THE VOLUME AND VELOCITY OF STORMWATER RUNOFF WITHIN THE SITE TO MINIMIZE SOIL EROSION.*
(2) *THE SUPPLEMENTAL ENGINEERING CALCULATIONS, PROVIDE DOCUMENTATION THAT DOWNSTREAM CHANNEL AND STREAM BANK EROSION WILL BE MINIMIZED.*
(3) *THE FINAL GRADING PLAN HAS BEEN DEVELOPED TO MINIMIZE ANY EXCESS GRADING OUTSIDE THE ACTUAL COURT AND BIORETENTION AREA. THE DESIGN ALSO ALLOWS THE BIORETENTION AREA TO BE UTILIZED AS A SEDIMENT TRAP TO MINIMIZE UNNECESSARY DISTURBANCES TO THE SURROUNDING AREA. FOR THESE REASONS, MINIMAL AMOUNT OF SOIL WILL BE EXPOSED DURING THE CONSTRUCTION*
(4) *THERE ARE NO EXISTING OR PROPOSED STEEP SLOPES LOCATED ON THIS PROJECT THAT WOULD BE CONSIDERED CRITICAL.*
(5) *THE FREQUENCY, INTENSITY, AND DURATION OF RAINFALL ARE THE PRINCIPAL FACTORS THAT INFLUENCE EROSION FROM A CONSTRUCTION SITE. CONSTRUCTION SEQUENCING SHALL INCLUDE THE REVIEW OF LOCAL WEATHER SOURCES TO MINIMIZE DISTURBANCE DURING INCLEMENT WEATHER.*
(6) *THERE ARE NO SURFACE WATERS OR NATURAL BUFFERS LOCATED WITHIN THE PROJECT.*
(7) *A SOIL STOCKPILE SHALL BE PROVIDED WITHIN THE LIMITS OF DISTURBANCE. TOPSOIL MAY BE UTILIZED TO HELP PROMOTE VEGETATION MEASURES FOR THE REMAINDER OF THE SITE THAT IS NOT COVERED BY IMPERVIOUS MATERIAL OR PART OF THE BIORETENTION FILTER AREA.*
(8) *STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER LAND-DISTURBING ACTIVITY HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASES ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING FOURTEEN (14) DAYS.*
(9) *A PROPOSED STORM PIPE SYSTEM HAS BEEN PROVIDED TO DIRECT THE INCREASED RUN-OFF TO AN ADEQUATE CHANNEL. THIS PIPE SYSTEM WILL ALSO BE USED INCONJUCTION WITH THE SEDIMENT TRAP TO ALLOW DISCHARGED RUN-OFFS TO NOT CREATE ANY DOWNSTREAM EROSION, ETC.*

3. STORMWATER MANAGEMENT PLAN:

a. New Construction Activities: *THE ENGINEERING CALCULATIONS, THAT HAVE BEEN REVIEWED AND APPROVED BY THE LOCAL VESCP, HAVE BEEN PREPARED IN ACCORDANCE WITH THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION 9VAC25-870.*

4. POLLUTION PREVENTION PLAN:

a. Potential Activities: *POTENTIAL POLLUTION SOURCES INCLUDE SEDIMENTS FROM DENUDED AREAS, LITTER, CONSTRUCTION DEBRIS, ASPHALT, FUEL, FUELING SPILLAGE, MAINTENANCE OF CONSTRUCTION EQUIPMENT, RUPTURE OF HYDRAULIC HOSES, OR OTHER EQUIPMENT FAILURES, SANITARY OR SOLID WASTES FROM CONSTRUCTION ACTIVITIES. REFER TO SHEET C-7 FOR A MORE DETAILED LIST OF ANY EXPECTED POLLUTANTS.*

b. *AT THE TIME OF THE PREPARATION OF THE CONSTRUCTION PLANS, THE EXACT LOCATION OF ANY OF THE NON-EROSION RELATED POLLUTION SOURCES, WHETHER CONTROLLED OR ACCIDENTAL IS NOT KNOWN. A PLAN VIEW OF THE PROJECT IS PROVIDED ON SHEET C-7 TO IDENTIFY AND RECORD THE LOCATIONS, ETC. IF REQUIRED.*

c. *REFER TO SHEET C-7 FOR ALL POTENTIAL NON-STORMWATER DISCHARGES THAT MAY BE ASSOCIATED WITH THIS PROJECT.*

d. *THE LIST OF QUALIFIED PERSONNEL PROVIDED IN SECTION 7 ARE ALSO RESPONSIBLE FOR IMPLEMENTING THE POLLUTION PREVENTION PRACTICE FOR POLLUTANT-GENERATING ACTIVITY.*

e. *SEE SHEET C-7 FOR A LIST OF POLLUTION PREVENTION PRACTICES AND PROCEDURES THAT SHALL BE IMPLEMENTED FOR LEAKS, SPILLS AND OTHER POTENTIAL POLLUTANT RELEASES.*

ACRONYMS

BMP	BEST MANAGEMENT PRACTICE
COV	CODE OF VIRGINIA
DEQ	DEPARTMENT OF ENVIRONMENT QUALITY
EPA	ENVIRONMENTAL PROTECTION AGENCY
ESC	EROSION & SEDIMENT CONTROL
RLD	RESPONSIBLE LAND DISTURBER (REGISTERED W/DEQ)
SWM	STORMWATER MANAGEMENT
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
VAC	VIRGINIA ADMINISTRATIVE CODE
VESCP	VIRGINIA EROSION & SEDIMENT CONTROL PROGRAM
VPDES	VIRGINIA POLLUTION DISCHARGE ELIMINATION SYSTEM
VSMP	VIRGINIA STORMWATER MANAGEMENT PROGRAM

5. DISCHARGES TO IMPAIRED WATERS:

a. Identification: *THE PROJECT LIES WITHIN THE THE 100-YEAR FLOODPLAIN FOR THE ROANOKE RIVER. THIS PORTION OF THE RIVER HAS BEEN DECLARED IMPAIRED.*

INFORMATION IS CURRENTLY AVAILABLE FROM THE INTERNET WEBSITE OF THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY, http://www.deq.virginia.gov/portals/0/DEQ/Water/TMDL/apptmdls/roanknvr/uroanbc.pdf

BASED ON THE REVIEW OF THE REPORTS THE FOLLOWING INFORMATION SHALL BE CONSIDERED IN THE METHODS OF CONSTRUCTION:

(1) Sediments : COMMON POLLUTANTS FROM THE LOCAL MS4 INCLUDE OIL AND GREASE FROM ROADWAYS, PESTICIDES FROM LAWNS, TRASH, AND SEDIMENTS, ETC. THIS PROJECT WILL INCORPORATE CONSTRUCTION MEASURES THAT ARE EFFECTIVE AND RESULT IN THE REDUCTION OR ELIMINATION OF SEDIMENT RELATED POLLUTANTS IN STORMWATER DISCHARGES AND AUTHORIZED NON-STORMWATER DISCHARGES FROM ALL CONSTRUCTION ACTIVITIES. THE PROJECT, WILL UTILIZE A BIORETENTION FILTER TO REDUCE POLLUTANT LEVELS FROM THE RUNOFF FROM THE PROPOSED IMPERVIOUS AND MANAGED TURF AREAS THAT WILL EVENTUALLY DISCHARGE TO THE ROANOKE RIVER. THE DESIGN OF THE EROSION AND SEDIMENT CONTROL PLAN, PROPER INSTALLATION AND MAINTENANCE OF THE PROPOSED PRACTICES, AND THE REQUIREMENTS TO STABILIZE ALL DENUDED AREAS WITHIN THE LIMITS OF CONSTRUCTION WILL HELP MINIMIZE THE CONTRIBUTION OF SEDIMENT TO THE ROANOKE RIVER.

b. Special Instructions:

(1) PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE.

(2) NUTRIENTS SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT BE APPLIED DURING RAINFALL EVENTS.

(3) A MODIFIED INSPECTION SCHEDULE SHALL BE IMPLEMENTED FOR THIS PROJECT. INSPECTIONS SHALL BE CONDUCTED AT A FREQUENCY OF:

i) AT LEAST ONCE EVERY FOUR BUSINESS DAYS or

ii) AT LEAST ONCE EVERY FIVE BUSINESS DAYS AND NO LATER THAN 48 HOURS FOLLOWNG A MEASURABLE STORM EVENT. IN THE EVENT THAT A MEASURABLE STORM EVENT OCCURS WHEN THERE ARE MORE THAN 48 HOURS BETWEEN BUSINESS DAYS, THE INSPECTION SHALL BE CONDUCTED ON THE NEXT BUSINESS DAY.

(1) THE PORTABLE TOILETS WILL BE LOCATED AWAY FROM ANY CONCENTRATED FLOW PATHS AND TRAFFIC FLOW AND WILL HAVE AN EPA ACCEPTED SECONDARY CONTAINMENT METHOD INSTALLED. THE USE OF PORTABLE LAVATORIES WITHIN THE FLOOD-PLAIN FOR ROANOKE RIVER WILL ALSO REQUIRE THAT IN THE EVENT OF HEAVY RAINFALL EVENTS OR POTENTIAL FLOODING THE LAVATORIES SHALL BE TEMPORARILY REMOVED FROM THE SITE AS SOON AS POSSIBLE, UNTIL FLOOD WATERS SUBSIDE BACK TO THE NORMAL RIVER BANKS.

6. QUALIFIED PERSONNEL:

THE FOLLOWING PERSONNEL ARE RESPONSIBLE FOR CONDUCTING INSPECTIONS. A QUALIFIED PERSON IS KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION & SEDIMENT CONTROL AND POLLUTION PREVENTION, WHO POSSES THE SKILLS TO ASSESS CONDITIONS AT THE CONSTRUCTION SITE THAT COULD IMPACT STORMWATER QUALITY, AND THE SKILLS TO ASSESS THE EFFECTIVENESS OF ANY STORMWATER CONTROLS SELECTED AND INSTALLED TO MEET THE REQUIREMENTS OF THIS PERMIT.

COMPANY OR ORGANIZATION NAME: _____
NAME: _____
POSITION: _____
ADDRESS: _____
CITY, STATE, ZIP CODE: _____
TELEPHONE NUMBER: _____
FAX/EMAIL: _____

COMPANY OR ORGANIZATION NAME: _____
NAME: _____
POSITION: _____
ADDRESS: _____
CITY, STATE, ZIP CODE: _____
TELEPHONE NUMBER: _____
FAX/EMAIL: _____

ATTACH ADDITIONAL FORMS IF ADDITIONAL QUALIFIED PERSONNEL ARE DELEGATED FOR THIS PROJECT.

7. DELEGATION OF AUTHORITY:

THE FOLLOWING SHALL BE IDENTIFIED AS THE OPERATORS OF THIS CONSTRUCTION ACTIVITY. THESE PERSONNEL HAVE THE CAPABILITY TO TO DELEGATE POWERS TO A DULY AUTHORIZED REPRESENTATIVE(s) TO SIGN THE CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP), ALL SWPPP MODIFICATIONS AND ROUTINE INSPECTION REPORTS

COMPANY OR ORGANIZATION NAME: _____
NAME: _____
POSITION: _____
ADDRESS: _____
CITY, STATE, ZIP CODE: _____
TELEPHONE NUMBER: _____
FAX/EMAIL: _____

COMPANY OR ORGANIZATION NAME: _____
NAME: _____
POSITION: _____
ADDRESS: _____
CITY, STATE, ZIP CODE: _____
TELEPHONE NUMBER: _____
FAX/EMAIL: _____

ATTACH ADDITIONAL FORMS IF ADDITIONAL QUALIFIED PERSONNEL ARE DELEGATED FOR THIS PROJECT.

8. SWPPP SIGNATURE:

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE READ AND UNDERSTAND THIS DOCUMENT AND THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

_____ SIGNATURE

_____ DATE

SWPPP AMENDMENTS, MODIFICATIONS, AND UPDATES:

THE OPERATOR OR THEIR DULY AUTHORIZED REPRESENTATIVE(s) SHALL REFER TO PART II, SECTION B FOR SUPPLEMENTAL REQUIREMENTS THAT MAY BE REQUIRED. THIS DOCUMENT MAY BE FOUND IN ITS ENTIRETY IN THE ENGINEERING CALCULATIONS.

THE GENERAL CONTRACTOR FOR THIS PROJECT WILL BE RESPONSIBLE FOR OBTAINING THE FINAL VPDES PERMIT FROM THE STATE OF VIRGINIA, DEPARTMENT OF ENVIRONMENTAL QUALITY. THIS PERMIT SHALL BE ACQUIRED THROUGH THE CITY OF ROANOKE PLANNING, BUILDING & DEVELOPMENT DEPARTMENT. AFTER THE VPDES HAS BEEN OBTAINED, THE GENERAL CONTRACTOR SHALL THEN APPLY FOR A LAND-DISTURBING PERMIT, AND SCHEDULE A PRE-CONSTRUCTION MEETING.

COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
General Permit No.: VAR10

IN COMPLIANCE WITH THE PROVISIONS OF THE CLEAN WATER ACT, AS AMENDED, AND PURSUANT TO THE VIRGINIA STORMWATER MANAGEMENT ACT AND REGULATIONS ADOPTED PURSUANT THERETO, OPERATORS OF CONSTRUCTION ACTIVITIES ARE AUTHORIZED TO DISCHARGE TO SURFACE WATERS WITHIN THE BOUNDARIES OF THE COMMONWEALTH OF VIRGINIA, EXCEPT THOSE SPECIFICALLY NAMED IN STATE WATER CONTROL BOARD REGULATIONS THAT PROHIBIT SUCH DISCHARGES.

THE AUTHORIZED DISCHARGE SHALL BE IN ACCORDANCE WITH THIS COVER PAGE, PART I – DISCHARGE AUTHORIZATION AND SPECIAL CONDITIONS, PART II – STORMWATER POLLUTION PREVENTION PLAN, AND PART III – CONDITIONS APPLICABLE TO ALL VPDES PERMITS AS SET FORTH HEREIN.

THE PERMIT, IN ITS ENTIRETY, IS PROVIDED WITH THE ENGINEERING CALCULATIONS AND ARE CONSIDERED AS A PART OF THE SWPPP.

A BASIC FRAMEWORK OF THIS PERMIT:

ALL PLANS INCORPORATED BY REFERENCE INTO THE SWPPP BECOME ENFORCEABLE UNDER THIS PERMIT. IF A PLAN INCORPORATED BY REFERENCE DOES NOT CONTAIN ALL OF THE REQUIRED ELEMENTS OF THE SWPPP OF SECTION II D, THE OPERATOR MUST DEVELOP THE MISSING ELEMENTS AND INCLUDE THEM IN THE REQUIRED SWPPP.

ONCE A DEFINABLE AREA HAS BEEN FINALLY STABILIZED, THE OPERATOR MAY MARK THIS ON THE SWPPP AND NO FURTHER SWPPP OR INSPECTION REQUIREMENTS APPLY TO THAT PORTION OF THE SITE .

THE SWPPP SHALL IDENTIFY ALL PROPERTIES THAT ARE NO LONGER UNDER THE CONTROL OF THE OPERATOR AND THE DATES ON WHICH THE OPERATOR NO LONGER HAD CONTROL OVER EACH PROPERTY.

THE OPERATOR MUST IMPLEMENT THE SWPPP AS WRITTEN AND UPDATE AS REQUIRED FROM COMMENCEMENT OF CONSTRUCTION ACTIVITY UNTIL FINAL STABILIZATION IS COMPLETE.

THE SWPPP SHALL BE RETAINED, ALONG WITH A COPY OF THIS PERMIT, REGISTRATION STATEMENT, AND ACKNOWLEDGEMENT LETTER FROM THE PERMIT-ISSUING AUTHORITY, AT THE CONSTRUCTION SITE OR OTHER LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITY TO THE DATE OF FINAL STABILIZATION. OPERATORS WITH DAY-TO-DAY OPERATIONAL CONTROL OVER SWPPP IMPLEMENTATION SHALL HAVE A COPY OF THE SWPPP AVAILABLE AT A CENTRAL LOCATION ON-SITE FOR THE USE OF ALL OPERATORS AND THOSE IDENTIFIED AS HAVING RESPONSIBILITIES UNDER THE SWPPP WHENEVER THEY ARE ON THE CONSTRUCTION SITE. THE SWPPP MUST BE MADE AVAILABLE, IN ITS ENTIRETY, TO THE DEPARTMENT, THE PERMIT-ISSUING AUTHORITY, AND THE OPERATOR OF A MUNICIPAL SEPARATE STORM SEWER SYSTEM RECEIVING DISCHARGES FROM THE SITE FOR REVIEW AT THE TIME OF AN ON-SITE INSPECTION. IF AN ON-SITE LOCATION IS UNAVAILABLE TO STORE THE SWPPP WHEN NO PERSONNEL ARE PRESENT, NOTICE OF THE SWPPP'S LOCATION MUST BE POSTED NEAR THE MAIN ENTRANCE AT THE CONSTRUCTION SITE.

THE OPERATOR SHALL MAKE THE SWPPP AND ALL UPDATES AVAILABLE UPON REQUEST TO THE DEPARTMENT; THE PERMIT-ISSUING AUTHORITY; EPA; A STATE OR LOCAL AGENCY APPROVING EROSION AND SEDIMENT CONTROL PLANS, GRADING PLANS, OR STORMWATER MANAGEMENT PLANS; LOCAL GOVERNMENT OFFICIALS; OR THE OPERATOR OF A MUNICIPAL SEPARATE STORM SEWER SYSTEM RECEIVING DISCHARGES FROM THE SITE.

A SIGN OR OTHER NOTICE MUST BE POSTED CONSPICUOUSLY NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE. THE SIGN OR OTHER NOTICE MUST CONTAIN THE FOLLOWING INFORMATION:

A. A COPY OF THE PERMIT COVERAGE LETTER THAN INCLUDES THE REGISTRATION NUMBER FOR THE CONSTRUCTION ACTIVITY; AND

B. THE INTERNET ADDRESS AT WHICH A COPY OF THE SWPPP MAY BE FOUND OR THE LOCATION OF A HARD COPY OF THE SWPPP AND NAME AND A TELEPHONE NUMBER OF A CONTACT PERSON FOR SCHEDULING VIEWING TIMES.

MAINTAINING AN UPDATED SWPPP.

A. THE OPERATOR SHALL AMEND THE SWPPP WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE THAT HAS A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO STATE WATERS AND THAT HAS NOT BEEN PREVIOUSLY ADDRESSED IN THE SWPPP.

B. THE SWPPP MUST BE AMENDED IF DURING INSPECTIONS OR INVESTIGATIONS BY THE OPERATOR'S QUALIFIED PERSONNEL, OR BY LOCAL, STATE OR FEDERAL OFFICIALS, IT IS DETERMINED THAT THE EXISTING CONTROL MEASURES ARE INEFFECTIVE IN MINIMIZING POLLUTANTS IN STORMWATER DISCHARGES FROM THE CONSTRUCTION SITE. REVISIONS TO THE SWPPP SHALL INCLUDE ADDITIONAL OR MODIFIED CONTROL MEASURES DESIGNED TO CORRECT PROBLEMS IDENTIFIED. IF APPROVAL BY A PLAN-APPROVING AUTHORITY IS NECESSARY FOR THE CONTROL MEASURE, REVISIONS TO THE SWPPP SHALL BE COMPLETED WITHIN SEVEN CALENDAR DAYS OF APPROVAL. IMPLEMENTATION OF THESE ADDITIONAL OR MODIFIED CONTROL MEASURES MUST BE ACCOMPLISHED AS DESCRIBED IN PART II G.

C. REVISIONS TO THE SWPPP MUST BE DATED AND SIGNED IN ACCORDANCE WITH THE SIGNATORY REQUIREMENTS FOUND IN THE VAR10 PERMIT.

D. THE SWPPP MUST CLEARLY IDENTIFY THE CONTRACTOR(S) OR SUBCONTRACTOR(S) THAT WILL IMPLEMENT AND MAINTAIN EACH MEASURE IDENTIFIED IN THE SWPPP. THE SWPPP SHALL BE REVISED TO IDENTIFY ANY NEW CONTRACTOR THAT WILL IMPLEMENT A MEASURE.

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

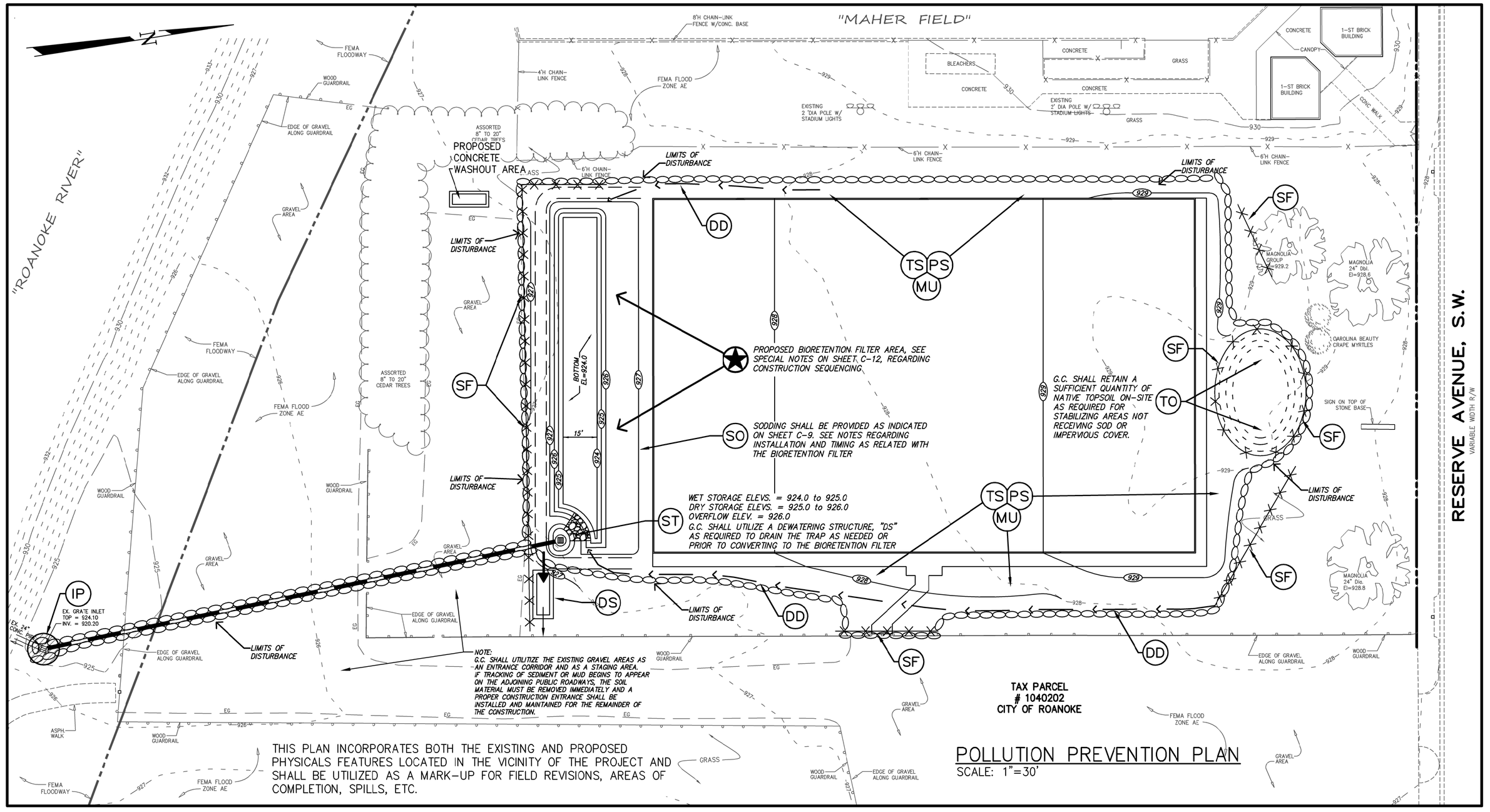
GENERAL PERMIT NO.: VAR10 – SUPPLEMENTAL INFORMATION

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK – NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed: J.V.J.
Drawn: J.V.J.
Checked: F.B.C.
Revised: 5/29/15
Scales: N/A
Tax Parcel: 1040202
N.B. No.: RKE CITY #10
W.O. No.: 14-0061

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM



THIS PLAN INCORPORATES BOTH THE EXISTING AND PROPOSED PHYSICALS FEATURES LOCATED IN THE VICINITY OF THE PROJECT AND SHALL BE UTILIZED AS A MARK-UP FOR FIELD REVISIONS, AREAS OF COMPLETION, SPILLS, ETC.

POLLUTION PREVENTION PLAN

SCALE: 1"=30'

IN CASE OF SPILLS

ANY OPERATOR WHO DISCHARGES OR CAUSES OR ALLOWS A DISCHARGE OF SEWAGE, INDUSTRIAL WASTE, OTHER WASTES OR ANY NOXIOUS OR DELETERIOUS SUBSTANCE OR A HAZARDOUS SUBSTANCE OR OIL IN AN AMOUNT EQUAL TO OR IN EXCESS OF A REPORTABLE QUANTITY ESTABLISHED UNDER EITHER 40 CFR PART 110, 40 CFR PART 117, 40 CFR PART 302, OR § 62.1-44.34:19 OF THE CODE OF VIRGINIA THAT OCCURS DURING A 24-HOUR PERIOD INTO OR UPON SURFACE WATERS OR WHO DISCHARGES OR CAUSES OR ALLOWS A DISCHARGE THAT MAY REASONABLY BE EXPECTED TO ENTER SURFACE WATERS, SHALL NOTIFY THE DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE DISCHARGE IMMEDIATELY UPON DISCOVERY OF THE DISCHARGE, BUT IN NO CASE LATER THAN WITHIN 24 HOURS AFTER SAID DISCOVERY. A WRITTEN REPORT OF THE UNAUTHORIZED DISCHARGE SHALL BE SUBMITTED TO THE DEPARTMENT AND THE VSMP AUTHORITY WITHIN FIVE DAYS OF DISCOVERY OF THE DISCHARGE. THE WRITTEN REPORT SHALL CONTAIN:

1. A DESCRIPTION OF THE NATURE AND LOCATION OF THE DISCHARGE;
2. THE CAUSE OF THE DISCHARGE;
3. THE DATE ON WHICH THE DISCHARGE OCCURRED;
4. THE LENGTH OF TIME THAT THE DISCHARGE CONTINUED;
5. THE VOLUME OF THE DISCHARGE;
6. IF THE DISCHARGE IS CONTINUING, HOW LONG IT IS EXPECTED TO CONTINUE;
7. IF THE DISCHARGE IS CONTINUING, WHAT THE EXPECTED TOTAL VOLUME OF THE DISCHARGE WILL BE; AND
8. ANY STEPS PLANNED OR TAKEN TO REDUCE, ELIMINATE AND PREVENT A RECURRENCE OF THE PRESENT DISCHARGE OR ANY FUTURE DISCHARGES NOT AUTHORIZED BY THIS GENERAL PERMIT.

- DEQ BLUE RIDGE REGIONAL OFFICE
  PHONE: (540) 562-6700
  FAX: (540) 562-6725
  FOR REPORTS OUTSIDE NORMAL WORKING HOURS, LEAVE A MESSAGE.
- VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT
  EMERGENCY OPERATIONS CENTER (EOC) PHONE: 1-(800) 468-8892

MATERIALS AND EQUIPMENT NECESSARY FOR OIL OR CHEMICAL SPILL CLEANUP WILL BE KEPT IN THE TEMPORARY MATERIAL STORAGE TRAILER ONSITE. EQUIPMENT WILL INCLUDE, BUT NOT BE LIMITED TO, BROOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAW DUST, AND PLASTIC AND METAL TRASH CONTAINERS.

ALL OIL OR OTHER CHEMICAL SPILLS WILL BE CLEANED UP IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM SEWERS WILL BE REPORTED TO THE NATIONAL RESPONSE CENTER AT 1-800-424-8802.

NON-STORMWATER DISCHARGES

THE FOLLOWING NON-STORM WATER DISCHARGES ARE ALLOWABLE AND CAN BE COMBINED WITH STORM WATER DISCHARGES FROM THE CONSTRUCTION ACTIVITY AT THIS SITE. HOWEVER, IN THE CASE WHERE THESE NON-STORM WATER DISCHARGES ARE COMBINED WITH STORM WATER DISCHARGES, APPROPRIATE POLLUTION PREVENTION MEASURES MUST BE IMPLEMENTED.

A. DISCHARGES FROM FIRE FIGHTING ACTIVITIES.
B. FIRE HYDRANT FLUSHING.
C. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED. VEHICLES WILL BE WASHED AT THE CONSTRUCTION ENTRANCE INSTALLED IN ACCORDANCE WITH STD. & SPEC. 3.02 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
D. WATER USED TO CONTROL DUST. METHODS AND MATERIALS OUTLINED IN STD. & SPEC. 3.39 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK WILL BE USED TO REDUCE DUST.
E. POTABLE WATER SOURCES, INCLUDING UNCONTAMINATED WATERLINE FLUSHINGS.
F. ROUTINE EXTERNAL BUILDING WASH DOWN WHICH DOES NOT USE DETERGENTS.
G. PAVEMENT WASH WATERS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED (UNLESS ALL SPILLED MATERIAL HAS BEEN REMOVED) AND WHERE DETERGENTS ARE NOT USED. PAVEMENT WILL BE CLEANED BY HAND SHOVELING AND SWEEPING AND INLET PROTECTION WILL BE INSTALLED PRIOR TO WASHING.
H. UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE.
I. UNCONTAMINATED GROUND WATER OR SPRING WATER.
J. FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS MATERIALS SUCH AS SOLVENTS.
K. UNCONTAMINATED EXCAVATION DEWATERING.
L. LANDSCAPE IRRIGATION.

POTENTIAL CONSTRUCTION SITE STORMWATER POLLUTANTS

TRADE NAME MATERIAL	CHEMICAL/PHYSICAL DESCRIPTION	STORM WATER POLLUTANTS
ANTIFREEZE / COOLANT	CLEAR GREEN/YELLOW LIQUID	ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)
ASPHALT	BLACK SOLID	oil, petroleum distillates
CLEANING SOLVENTS	COLORLESS, BLUE OR YELLOW-GREEN LIQUID	perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates
CONCRETE	WHITE SOLID	limestone , sand
DIESEL FUEL	CLEAR, BLUE-GREEN TO YELLOW LIQUID	petroleum distillate, oil & grease, naphtholene, xylenes
EROSION	SOLID PARTICLES	soil , sediment
FERTILIZER	LIQUID OR SOLID GRAINS	nitrogen , phosphorous
GASOLINE	COLORLESS, PALE BROWN OR PINK PETROLEUM HYDROCARBON	benzene, ethyl benzene, toluene, xylene, MTBE
GLUE , ADHESIVES	WHITE OR YELLOW LIQUID	polymers , epoxies
HYDRAULIC OIL / FLUIDS	BROWN OILY PETROLEUM HYDROCARBON	mineral oil
PAINTS	WHITE OR YELLOW LIQUID	metal oxides, stoddard solvent, talc, calcium carbonate, arsenic
SANITARY TOILETS	VARIOUS COLORED LIQUIDS	bacteria, parasites & viruses
WASTEWATER FROM CONSTRUCTION EQUIPMENT WASHING	WATER	soil, oil & grease, solids
WOOD PRESERVATIVES	CLEAR AMBER OR DARK BROWN LIQUID	stoddard solvent, petroleum distillates, arsenic, copper chromium

POLLUTION PREVENTION PRACTICES

1. FUELS AND OILS:
A. ON-SITE VEHICLE REFUELING WILL BE CONDUCTED IN A DEDICATED LOCATION AWAY FROM DIRECT ACCESS TO ANY SURFACE WATERS. SINCE THE LOCATION OF FUELING ACTIVITIES WILL PERIODICALLY MOVE DURING CONSTRUCTION, THE DESIGN PLANS DO NOT CONTAIN A SPECIFIC LOCATION. FOR EACH PHASE OF WORK A LOCATION WILL BE DETERMINED IN THE FIELD AND NOTED IN THE SITE INSPECTION LOG. CONTAINMENT BERMS WILL BE LOCATED ADJACENT TO THE REFUELING AREA THAT WILL CONTAIN ANY INADVERTENT SPILLS UNTIL THEY CAN BE CLEANED UP. ANY ON-SITE STORAGE TANKS WILL HAVE A MEANS OF SECONDARY CONTAINMENT. IN THE EVENT OF A SPILL, IT WILL BE CLEANED UP IMMEDIATELY AND THE MATERIAL, INCLUDING ANY CONTAMINATED SOIL, WILL BE DISPOSED OF ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS.
B. ALL VEHICLES ON SITE WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE.
C. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.
D. SPILL KITS WILL BE INCLUDED WITH ALL FUELING SOURCES AND MAINTENANCE ACTIVITIES.
E. ANY ASPHALT SUBSTANCES USED ONSITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

2. SOLID WASTE:
A. NO SOLID MATERIALS SHALL BE DISCHARGED TO SURFACE WATER. SOLID MATERIALS, INCLUDING BUILDING MATERIALS, GARBAGE, AND DEBRIS SHALL BE CLEANED UP DAILY AND DEPOSITED INTO DUMPSTERS, WHICH WILL BE PERIODICALLY REMOVED FROM THE SITE AND DEPOSITED INTO A LANDFILL.

3. FERTILIZER:
A. FERTILIZERS WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENCED BY THE MANUFACTURER.
B. FERTILIZERS WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER.
C. FERTILIZERS WILL BE STORED IN A COVERED SHED AND PARTIALLY USED BAGS WILL BE TRANSFERRED TO A SEALABLE BIN TO AVOID SPILLS.

4. PAINT AND OTHER CHEMICALS:
A. ALL PAINT CONTAINERS AND CURING COMPOUNDS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWERS, BUT WILL BE PROPERLY DISPOSED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
B. SPRAY GUNS WILL BE CLEANED ON A REMOVABLE TARP.
C. CHEMICALS USED ON-SITE ARE KEPT IN SMALL QUANTITIES AND STORED IN CLOSED CONTAINERS UNDERCOVER AND KEPT OUT OF DIRECT CONTACT WITH STORM WATER. AS WITH FUELS AND OILS, ANY INADVERTENT SPILLS WILL BE CLEANED UP IMMEDIATELY AND DISPOSED OF ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.

5. CONCRETE:
A. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE, EXCEPT IN THE DESIGNATED CONCRETE WASHOUT AREA SHOWN. G.C. SHALL REFER TO AND ADHERE TO THE E.P.A., STORMWATER BEST MANAGEMENT PRACTICE, "CONCRETE WASHOUT", PUBLICATION 833-F-11-006.

6. WATER TESTING:
A. WHEN TESTING/CLEANING OF WATER SUPPLY LINES, THE DISCHARGE FROM THE TESTED PIPE WILL BE COLLECTED AND CONVEYED TO A COMPLETED STORM WATER PIPE SYSTEM FOR ULTIMATE DISCHARGE INTO A SEDIMENTATION BASIN OR SWM/BMP FACILITY.

7. SANITARY WASTE:
A. PORTABLE LAVATORIES ARE LOCATED ON-SITE AND ARE SERVICED ON A REGULAR BASIS BY A CONTRACTOR. THEY WILL BE LOCATED IN UPLAND AREAS AWAY FROM DIRECT CONTACT WITH SURFACE WATERS. ANY SPILLS OCCURRING DURING SERVICING WILL BE CLEANED UP IMMEDIATELY, INCLUDING ANY CONTAMINATED SOILS, AND DISPOSED OF ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

8. GRADING AND E & S ACTIVITIES:
A. A RECORD OF THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR, WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, AND WHEN STABILIZATION MEASURES ARE INITIATED SHALL BE MAINTAINED AND INCLUDED IN THE LOG BOOK FOR THIS PROJECT.

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

POLLUTION PREVENTION PLAN

CITY OF ROANOKE

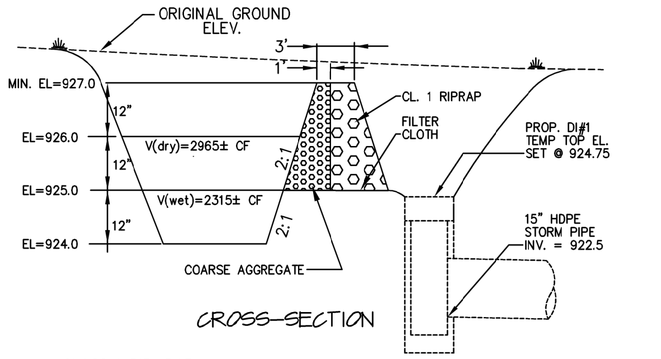
DEPARTMENT of PARKS and RECREATION

PROPOSED TENNIS COURTS

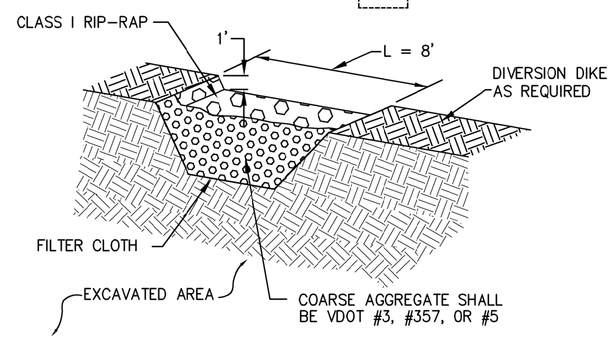
SITUATE RIVERS EDGE PARK - NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	1"=30'
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM



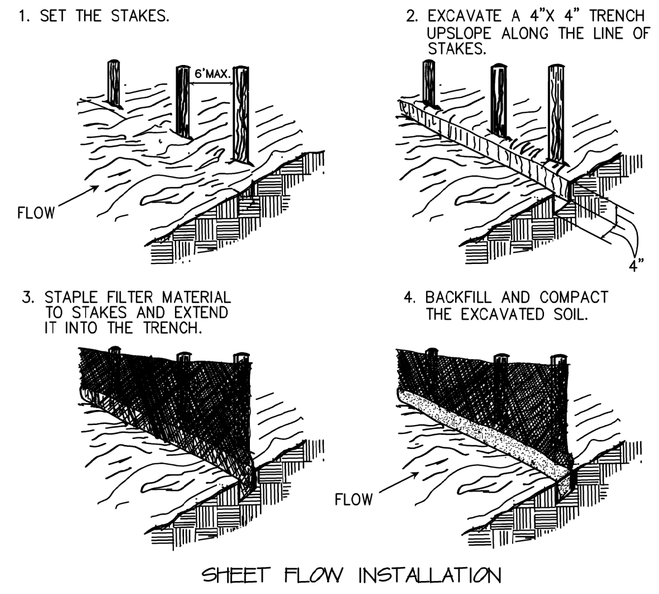
CROSS-SECTION



MAINTENANCE:
1. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN VOLUME OF THE WET STORAGE. G.C. SHALL UTILIZE A DEWATERING STRUCTURE, "DS" AS REQUIRED TO DRAIN THE TRAP AS NEEDED OR PRIOR TO CONVERTING TO THE BIORETENTION FILTER. THE ACCUMULATED SEDIMENT WHICH IS REMOVED FROM THE DEWATERING STRUCTURE MAY BE SPREAD ON-SITE (WITHIN THE LIMITS OF DISTURBANCE) AND STABILIZED OR DISPOSED OF AT AN APPROVED DISPOSAL SITE.
2. FILTER STONE SHALL BE REGULARLY CHECKED TO ENSURE THAT FILTRATION PERFORMANCE IS MAINTAINED. STONE CHOKED WITH SEDIMENT SHALL BE REMOVED AND CLEANED OR REPLACED.
3. THE STRUCTURE SHOULD BE CHECKED REGULARLY TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT. THE HEIGHT OF THE STONE OUTLET SHOULD BE CHECKED TO ENSURE THAT ITS CENTER IS AT LEAST 1 FOOT BELOW THE TOP OF THE EMBANKMENT.

(ST) SEDIMENT TRAP
(see plan for trap dimensions)

CONSTRUCTION OF A SILT FENCE
(WITHOUT WIRE SUPPORT)

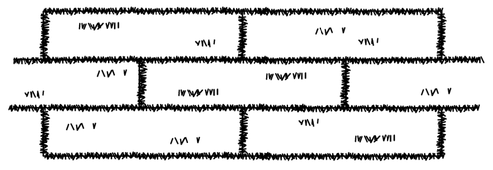


SHEET FLOW INSTALLATION

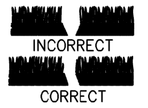
SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, DATED 1992, PLATE 3.05-2

MAINTENANCE:
1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED SILT FENCE RESULTING FROM END RUNS AND UNDERCUTTING.
3. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
4. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
5. ANY SEDIMENT DEPOSITS REMAINING IN-PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSES TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

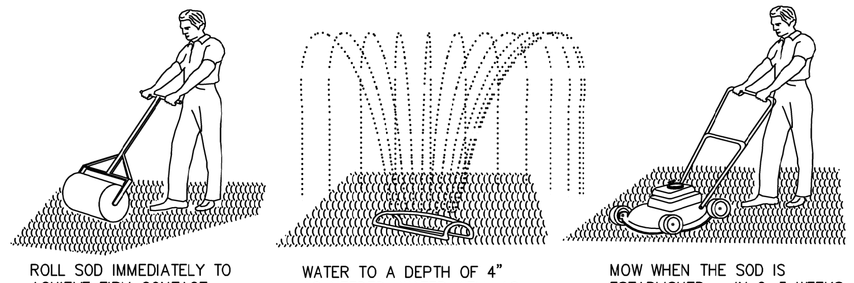
(SF) SILT FENCE



LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.



BUTTING - ANGLED ENDS CAUSED BY THE AUTO-MATIC SOD CUTTER MUST BE MATCHED CORRECTLY.

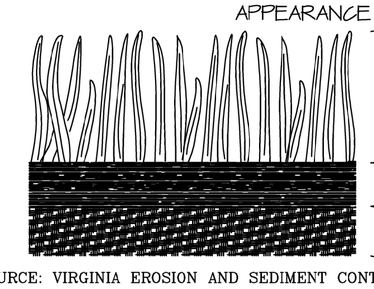


ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.

WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.

MOW WHEN THE SOD IS ESTABLISHED - IN 2-3 WEEKS. SET THE MOWER HIGH (2"-3").

APPEARANCE OF GOOD SOD



SHOOTS OR GRASS BLADES. GRASS SHOULD BE GREEN AND HEALTHY, MOWED AT A 2"-3" CUTTING HEIGHT.

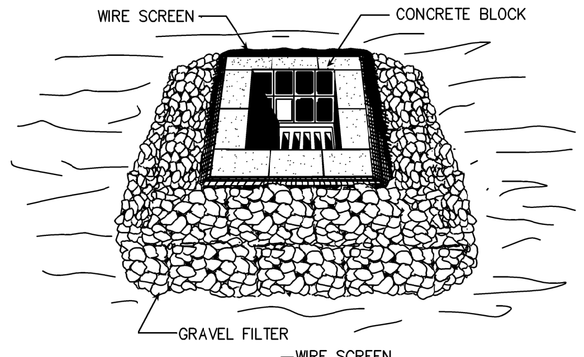
THATCH - GRASS CLIPPINGS AND DEAD LEAVES, UP TO 1/2" THICK.

ROOT ZONE - SOIL AND ROOTS. SHOULD BE 1/2"-3/4" THICK, WITH DENSE ROOT MAT FOR STRENGTH.

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, DATED 1992, PLATE 3.33-1

MAINTENANCE:
1. DURING THE 2 TO 3 WEEK ESTABLISHMENT STAGE, SOD SHALL BE WATERED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE IN THE ROOT ZONE AND PREVENT DORMANCY OF SOD.
2. NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHOULD BE REMOVED IN ANY MOWING. GRASS HEIGHT SHOULD BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED.
3. AFTER THE FIRST GROWING SEASON, ESTABLISHED SOD WILL REQUIRE FERTILIZATION AND MAY REQUIRE LIME. FOLLOW SOIL TEST RECOMMENDATIONS WHEN POSSIBLE, OR APPLY MAINTENANCE LEVELS AS OUTLINED IN TABLE 3.33-B OF THE V.E.S.C.H.

(SO) SODDING



THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

GRAVEL SHALL BE VDOT #3. #357 OR #5 COARSE AGGREGATE.

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, DATED 1992, PLATE 3.07-3.

MAINTENANCE:
1. THE STRUCTURE SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL CONFIGURATION WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED TO A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

(IP) INLET PROTECTION

SITE CONSIDERATIONS:
1. WHETHER AN ADEQUATE VOLUME OF TOPSOIL EXISTS ON THE SITE OR NOT, TOPSOIL SHALL BE SPREAD AT A COMPACTED DEPTH OF 2 TO 4 INCHES (DEPTHS CLOSER TO 4 INCHES ARE PREFERRED) WHEN INDICATED ON THE PLANS.
2. LOCATE ANY TOPSOIL STOCKPILES SO THAT IT MEETS VESCH SPECIFICATIONS AND DOES NOT INTERFERE WITH WORK ON THE SITE.
3. ALLOW SUFFICIENT TIME IN SCHEDULING FOR TOPSOIL TO BE SPREAD AND BONDED PRIOR TO SEEDING, SODDING, OR PLANTING.
4. CARE MUST BE TAKEN NOT TO APPLY TOPSOIL TO SUBSOIL IF THE TWO SOILS HAVE CONTRASTING TEXTURES. CLAYEY TOPSOIL OVER SANDY SUBSOIL IS A PARTICULARLY POOR COMBINATION, AS WATER MAY CREEP ALONG THE JUNCTION BETWEEN THE SOIL LAYERS, CAUSING THE TOPSOIL TO SLOUGH. SANDY TOPSOIL OVER A CLAY SUBSOIL IS EQUALLY AS LIKELY TO FAIL.
5. IF TOPSOIL AND SUBSOIL ARE NOT PROPERLY BONDED, WATER WILL NOT INFILTRATE THE SOIL PROFILE EVENLY AND IT WILL BE DIFFICULT TO ESTABLISH VEGETATION. TOPSOILING OF STEEP SLOPES SHOULD BE DISCOURAGED UNLESS GOOD BONDING OF SOILS CAN BE ACHIEVED.

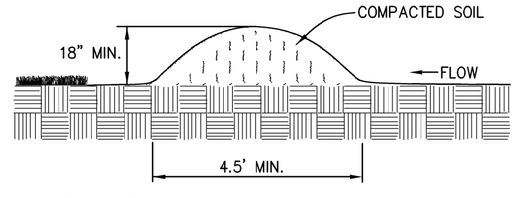
SPECIFICATIONS
1. FIELD EXPLORATION OF THE SITE SHALL BE MADE TO DETERMINE IF THERE IS SUFFICIENT SURFACE SOIL OF GOOD QUALITY TO JUSTIFY STRIPPING. TOPSOIL SHALL BE FRIABLE AND LOAMY (LOAM, SANDY LOAM, SILT LOAM, SANDY CLAY LOAM, CLAY LOAM). IT SHALL BE FREE OF DEBRIS, TRASH, STUMPS, ROCKS, ROOTS, AND NOXIOUS WEEDS, AND SHALL GIVE EVIDENCE OF BEING ABLE TO SUPPORT HEALTHY VEGETATION. IT SHALL CONTAIN NO SUBSTANCE THAT IS POTENTIALLY TOXIC TO PLANT GROWTH.
2. ALL TOPSOIL SHALL BE TESTED BY A RECOGNIZED LABORATORY FOR THE FOLLOWING CRITERIA:
A. ORGANIC MATTER CONTENT SHALL BE NOT LESS THAN 1.5% BY WEIGHT.
B. PH RANGE SHALL BE FROM 6.0-7.5. IF PH IS LESS THAN 6.0, LIME SHALL BE ADDED IN ACCORDANCE WITH SOIL TEST RESULTS OR IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE VEGETATIVE ESTABLISHMENT PRACTICE BEING USED.
C. SOLUBLE SALTS SHALL NOT EXCEED 500 PPM.
3. IF ADDITIONAL OFF-SITE TOPSOIL IS NEEDED, IT MUST MEET THE STANDARDS STATED ABOVE. STRIPPING TOPSOIL OPERATIONS SHOULD NOT BE PERFORMED WHEN THE SOIL IS WET OR FROZEN. STRIPPING SHALL BE CONFINED TO THE IMMEDIATE CONSTRUCTION AREA. A 4-TO 6-INCH STRIPPING DEPTH IS COMMON, BUT DEPTH MAY VARY DEPENDING ON THE PARTICULAR SOIL. ALL PERIMETER DIKES, BASINS, AND OTHER SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO STRIPPING.

SITE PREPARATION PRIOR TO AND MAINTENANCE DURING TOPSOILING
1. BEFORE TOPSOILING, ESTABLISH NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, DIKES, LEVEL SPREADERS, WATERWAYS, SEDIMENT BASINS, ETC. THESE PRACTICES MUST BE MAINTAINED DURING TOPSOILING.
2. PREVIOUSLY ESTABLISHED GRADES ON THE AREAS TO BE TOPSOILED SHALL BE MAINTAINED ACCORDING TO THE APPROVED PLAN.
3. WHERE THE PH OF THE SUBSOIL IS 6.0 OR LESS, OR THE SOIL IS COMPOSED OF HEAVY CLAYS, AGRICULTURAL LIMESTONE SHALL BE SPREAD IN ACCORDANCE WITH THE SOIL TEST OR THE VEGETATIVE ESTABLISHMENT PRACTICE BEING USED.
4. AFTER THE AREAS TO BE TOPSOILED HAVE BEEN BROUGHT TO GRADE, AND IMMEDIATELY PRIOR TO DUMPING AND SPREADING THE TOPSOIL, THE SUBGRADE SHALL BE LOOSENED BY DISCING OR SCARIFYING TO A DEPTH OF AT LEAST 2 INCHES TO ENSURE BONDING OF THE TOPSOIL AND SUBSOIL.

APPLYING TOPSOIL:
1. TOPSOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN TOPSOIL OR SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING. THE TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED TO A MINIMUM COMPACTED DEPTH OF 2 INCHES ON 3:1 OR STEEPER SLOPES AND 4 INCHES ON FLATTER SLOPES. ANY IRREGULARITIES IN THE SURFACE, RESULTING FROM TOPSOILING OR OTHER OPERATIONS, SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
2. IT IS NECESSARY TO COMPACT THE TOPSOIL ENOUGH TO ENSURE GOOD CONTACT WITH THE UNDERLYING SOIL AND TO OBTAIN A LEVEL SEEDBED FOR THE ESTABLISHMENT OF HIGH MAINTENANCE TURF. HOWEVER, UNDUE COMPACTION IS TO BE AVOIDED AS IT INCREASES RUNOFF VELOCITY AND VOLUME, AND DETERS SEED GERMINATION. SPECIAL CONSIDERATION SHOULD BE GIVEN TO THE TYPES OF EQUIPMENT USED TO PLACE TOPSOIL IN AREAS TO RECEIVE FINE TURF. AVOID UNNECESSARY COMPACTION BY HEAVY MACHINERY WHENEVER POSSIBLE. IN AREAS WHICH ARE NOT GOING TO BE MOWED, THE SURFACE SHOULD BE LEFT ROUGH IN ACCORDANCE WITH SURFACE ROUGHENING (VESCH STD. & SPEC. 3.29).

SOIL STERILANTS
1. NO SOD OR SEED SHALL BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS UNTIL SUFFICIENT TIME HAS ELAPSED TO PERMIT DISSIPATION OF TOXIC MATERIALS.

(TO) TOPSOILING



MAINTENANCE:
1. THE MEASURE SHALL BE INSPECTED AFTER EVERY STORM AND REPAIRS MADE TO THE DIKE, FLOW CHANNEL, OUTLET OR SEDIMENT TRAPPING FACILITY, AS NECESSARY. ONCE EVERY TWO WEEKS, WHETHER A STORM EVENT HAS OCCURRED OR NOT, THE MEASURE SHALL BE INSPECTED AND REPAIRS MADE IF NEEDED. DAMAGES CAUSED BY CONSTRUCTION TRAFFIC OR OTHER ACTIVITY MUST BE REPAIRED BEFORE THE END OF EACH WORKING DAY.

(DD) TEMPORARY DIVERSION DIKE

DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE STABILIZED WITH TEMPORARY SEEDING MEASURES AS SHOWN HEREON, AND AS FURTHER DETAILED AS "STANDARD AND SPECIFICATION 3.31 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", LATEST EDITION. IN ADDITION TO AREAS OF GENERAL GRADING THAT WILL NOT BE FINE-GRADED FOR GREATER THAN 30 DAYS, THE FOLLOWING SPECIFIC E&S MEASURES SHALL BE STABILIZED WITH TEMPORARY SEEDING IMMEDIATELY UPON COMPLETION OF CONSTRUCTION OF THE TEMPORARY MEASURE:
- SOIL STOCKPILES
- DIKES, DAMS, AND SIDES OF SEDIMENT BASINS
- TEMPORARY ROADWAY EMBANKMENTS

PRIOR TO SEEDING, INSTALL NECESSARY EROSION CONTROL PRACTICES SUCH AS DIKES, WATERWAYS, AND BASINS. PROVIDE PLANTS AS SPECIFIED HEREIN, OR ENGINEER-APPROVED EQUAL.

SEEDBED PREPARATION:
LIME SHALL BE APPLIED IF DISTURBED AREAS WILL REMAIN DORMANT BETWEEN 30 DAYS AND 120 DAYS. IF REQUIRED, LIME SHALL BE APPLIED AS SHOWN, BASED ON SOIL ACIDITY.

pH	APPLICATION OF AGRICULTURAL LIMESTONE
BELOW 4.2	3 TONS PER ACRE
4.2 TO 5.2	2 TONS PER ACRE
5.2 TO 6.0	1 TON PER ACRE
ABOVE 6.0	LIME NOT REQUIRED

FERTILIZING:
FERTILIZER SHALL BE APPLIED AS 600 LBS/ACRE OF 10-20-10 OR EQUIVALENT NUTRIENTS. LIME (AS APPLICABLE) AND FERTILIZER SHALL BE INCORPORATED INTO THE TOP 2 TO 4 INCHES OF SOIL, IF POSSIBLE.

SURFACE ROUGHENING SHALL BE REQUIRED WHERE AREAS TO BE SEEDED HAVE BEEN COMPACTED, CRUSTED, OR HARDENED BY CONSTRUCTION TRAFFIC. AS REQUIRED, SEEDBEDS SHALL BE ROUGHENED IN ACCORDANCE WITH STANDARD AND SPECIFICATION 3.29 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. (TRACKING WITH BULLDOZER CLEATS SHALL BE USED IN SANDY SOILS)

SEEDING:
SEED SHALL BE EVENLY APPLIED WITH THE SAME MEANS SPECIFIED HEREIN FOR PERMANENT SEEDING. SMALL GRAINS SHALL BE PLANTED NO MORE THAN ONE INCH DEEP. GRASSES AND LEGUMES SHALL BE PLANTED WITH NO LESS THAN 1/4" OF SOIL COVER.

MULCHING:
SEEDING MADE IN FALL FOR WINTER COVER AND DURING HOT AND DRY SUMMER MONTHS SHALL BE MULCHED ACCORDING TO STANDARD AND SPECIFICATION 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, EXCEPT THAT FIBER MULCH MAY NOT BE USED. STRAW MULCH SHALL BE USED DURING THESE PERIODS. TEMPORARY SEEDING MADE UNDER FAVORABLE SOIL AND SITE CONDITIONS DURING OPTIMUM SPRING AND FALL SEEDING DATES MAY NOT REQUIRE MULCH.

RE-SEEDING:
AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION SHALL BE RE-SEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS BY RANGE OF PLANTING DATES:

09/01 TO 02/15	ANNUAL RYEGRASS @ 50 LB / ACRE & WINTER RYE @ 50 LB / ACRE
02/16 TO 04/30	ANNUAL RYEGRASS @ 100 LB / ACRE
05/01 TO 08/31	GERMAN MILLET @ 50 LB / ACRE

(TS) TEMPORARY SEEDING

DISTURBED AREAS SHALL BE PERMANENTLY SEEDED WITHIN SEVEN (7) DAYS OF ACHIEVING FINAL GRADE, OR ON DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE WITHIN ONE YEAR.

TYPE A

03/15 TO 05/15 OR 08/16 TO 10/31:	ANNUAL RYEGRASS @ 20 LB / ACRE RED TOP @ 2 LB / ACRE TALL FESCUE @ 150 LB / ACRE
05/16 TO 08/15:	FOXTAIL MILLET @ 20 LB / ACRE RED TOP @ 20 LB / ACRE TALL FESCUE @ 150 LB / ACRE
11/01 TO 02/28:	WINTER RYE @ 20 LB / ACRE RED TOP @ 20 LB / ACRE TALL FESCUE @ 150 LB / ACRE

TYPE B (SLOPES 3:1 OR STEEPER)

03/15 TO 05/15 OR 08/16 TO 10/31:	CROWN VETCH @ 20 LB / ACRE ANNUAL RYEGRASS @ 20 LB / ACRE RED TOP @ 20 LB / ACRE KY 31 FESCUE @ 108 LB / ACRE
05/16 TO 08/15:	CROWN VETCH @ 20 LB / ACRE FOXTAIL MILLET @ 20 LB / ACRE RED TOP @ 20 LB / ACRE KY 31 FESCUE @ 108 LB / ACRE
11/01 TO 02/28:	CROWN VETCH @ 20 LB / ACRE WINTER RYE @ 20 LB / ACRE RED TOP @ 20 LB / ACRE KY 31 FESCUE @ 108 LB / ACRE

LIME: 4,000 LB / ACRE PULVERIZED AGRICULTURAL LIMESTONE

FERTILIZER: 10-20-10 @ 1,000 LB / ACRE

MULCH: SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN STRICT ACCORDANCE WITH STANDARD AND SPECIFICATION 3.35 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

SOIL CONDITIONING: INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE CITY ENGINEER.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

(PS) PERMANENT SEEDING

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

VIRGINIA E.S.C. DETAILS

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK - NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	AS SHOWN
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM

LANDSCAPE REQUIREMENTS

BIORETENTION:

PER REQUIREMENTS OF THE PROPOSED LANDSCAPE TEMPLATE FOR A BIORETENTION FILTER, ONE (1) TREE SHALL BE PROVIDED FOR EACH 250 OF SURFACE AREA OF MEDIA.

DESIGNED SURFACE AREA = 2075 S.F.
TREES REQUIRED = 2075 / 250 = 9
TREES PROVIDED = 12

THE FOLLOWING ARE ACCEPTED BY THE VIRGINIA DEQ AND WILL CONTRIBUTE TO THE LANDSCAPE CANOPY REQUIREMENTS STATED BELOW:

THE FOLLOWING SMALL DECIDUOUS TREES ARE ACCEPTACLE:

SYMBOL

COMMON NAME	BOTANICAL NAME
SERVICEBERRY	Amelanchier canadensis
REDBUD	Cercis candensis
FRINGETREE	Chionanthus virginicus

MIN. CALIPER AT PLANTING 2"

CITY CANOPY:

THE APPLICABLE REQUIREMENTS SET FORTH BY SEC. 36.2-641 OF THE CODE OF THE CITY, STATES: THAT THE REQUIREMENTS OF THIS DIVISION SHALL ONLY APPLY TO THOSE PORTIONS OF THE SITE THAT ARE AFFECTED BY THE PROPOSED IMPROVEMENTS.

THE PROJECT AREA = 1.42 ACRES OR 61,856 S.F.

FOR INPUD DISTRICTS, A 10% TREE CANOPY IS REQUIRED.
10% OF 61,856 S.F. = 6,186 S.F.

ALL TREES REQUIRED SHALL BE SELECTED FROM THE APPROVED TREE LIST, TABLE 642-1 OF THE CODE OF THE CITY. A PROPOSED TREE LIST SHALL BE SUBMITTED TO THE DIRECTOR OF PARKS AND RECREATION, MR. DONNIE UNDERWOOD, PRIOR TO PURCHASING AND PLANTING.

A 50:50 MIXTURE OF SMALL DECIDOUS TREES AND LARGE DECIDOUS TREE SHALL BE PROVIDED, EXCLUSIVE OF THE BIORETENTION TREE.

SYMBOL

REPRESENTS A LARGE DECIDUOUS TREE, MIN. CANOPY = 254 SF

REPRESENTS A SMALL DECIDUOUS TREE, MIN. CANOPY = 177 SF

CANOPY PROVIDED:

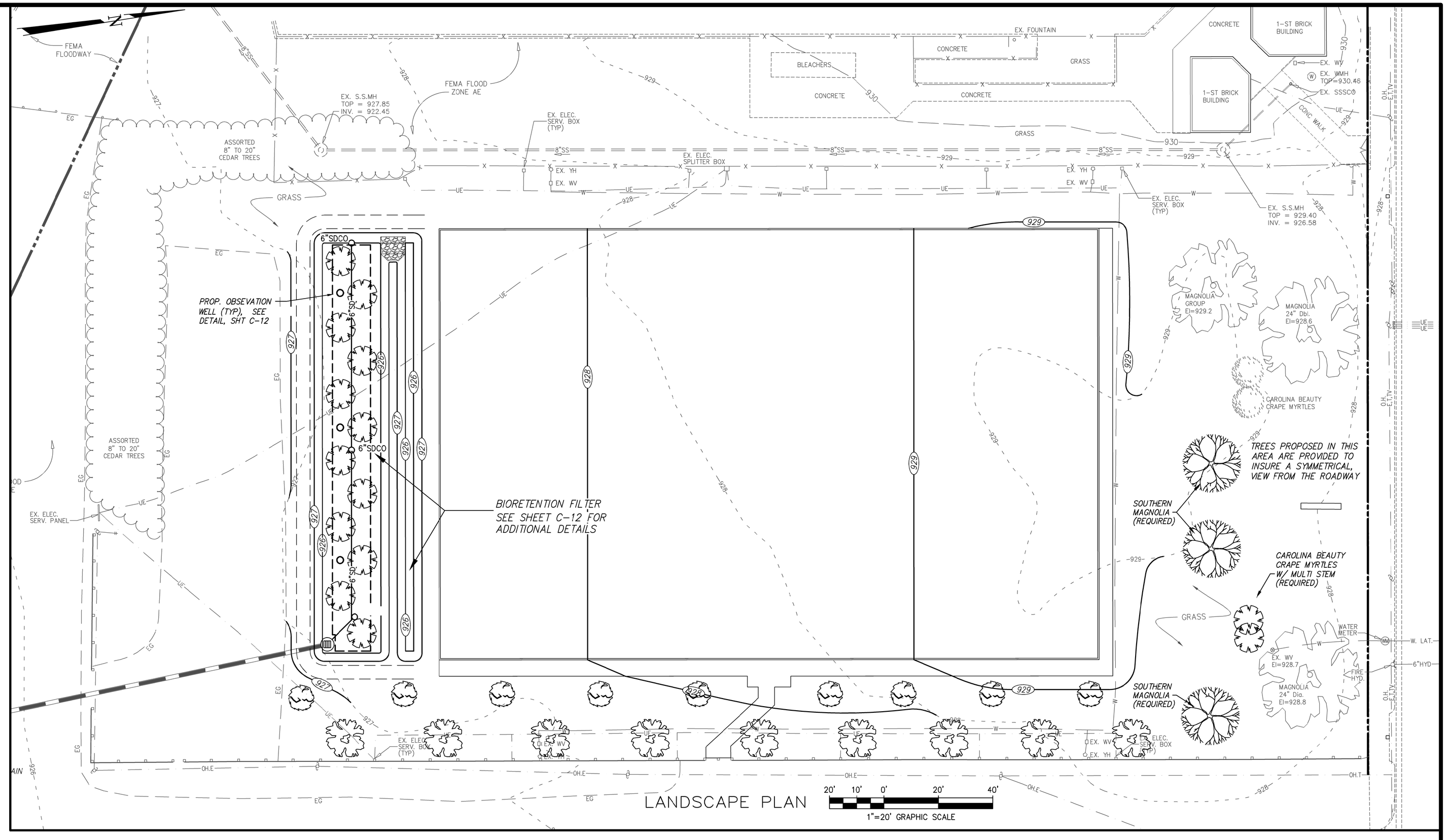
SERVICEBERRY	4 TREES	X	201 SF	=	804 SF
REDBUD	4 TREES	X	177 SF	=	708 SF
FRINGETREE	4 TREES	X	113 SF	=	452 SF
SOUTHERN MAG	3 TREES	X	177 SF	=	531 SF
CRAPE MYRTLE	2 TREES	X	113 SF	=	226 SF
SMALL DECID.	9 TREES	X	177 SF	=	1593 SF
LARGE DECID.	9 TREES	X	254 SF	=	2286 SF
			TOTAL	=	6600 SF

STREET YARD TREES:

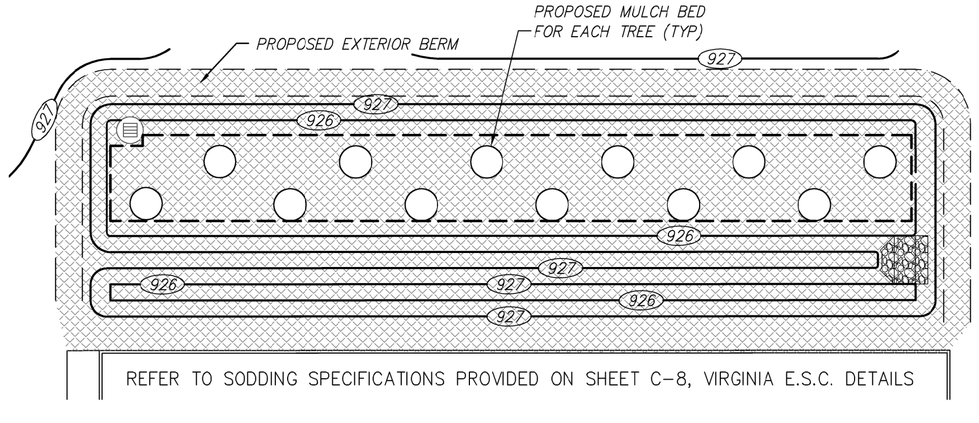
DECIDUOUS TREES, AS SET FORTH IN SECTION 36.2-642, TABLE 642-1, OF THE CITY OF ROANOKE ZONING ORDINANCE SHALL BE PROVIDED BETWEEN THE BUILDING LINE AND ANY PUBLIC RIGHT-OF-WAY WHEN SUCH BUILDING LINE IS TWENTY-FIVE (25) FEET OR MORE FROM THE ABUTTING PUBLIC RIGHT-OF-WAY. ONE (1) SUCH TREE SHALL BE PROVIDED FOR EACH FIFTY (50) FEET OF LOT FRONTAGE, OR PORTION THEREOF, EXCLUSIVE OF ANY PERIMETER PARKING AREA LANDSCAPING STRIPS AS REQUIRED IN SECTION 36.2-648(B)(5).

CURRENT SETBACK AS ESTABLISHED BY EXISTING FIELDHOUSES FOR MAHER FIELD = 15'

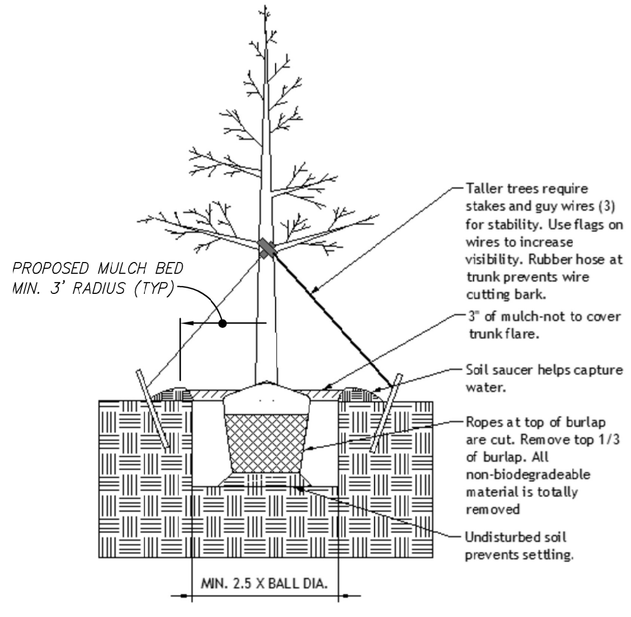
TREES REQD. WITHIN 25' SETBACK = 0



LANDSCAPE PLAN



SODDING LIMITS



TREE MULCHING

BIORETENTION AREA PLANTING SPECIFICATIONS

1. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT FROM THE SOURCE TO THE JOB SITE AND UNTIL PLANTED.
2. WALLS OF PLANTING PIT SHALL BE DUG SO THAT THEY ARE VERTICAL.
3. THE DIAMETER OF THE PLANTING PIT MUST BE A MINIMUM OF SIX INCHES (6") LARGER THAN THE DIAMETER OF THE BALL OF THE TREE.
4. THE PLANTING PIT SHALL BE DEEP ENOUGH TO ALLOW 1/8 OF THE OVERALL DIMENSION OF THE ROOT BALL TO BE ABOVE GRADE. LOOSE SOIL AT THE BOTTOM OF THE PIT SHALL BE TAMPED BY HAND.
5. THE APPROPRIATE AMOUNT OF FERTILIZER IS TO BE PLACED AT THE BOTTOM OF THE PIT (SEE BELOW FOR FERTILIZATION RATES).
6. THE PLANT SHALL BE REMOVED FROM THE CONTAINER AND PLACED IN THE PLANTING PIT BY LIFTING AND CARRYING THE PLANT BY ITS' BALL (NEVER LIFT BY BRANCHES OR TRUNK).
7. SET THE PLANT STRAIGHT AND IN THE CENTER OF THE PIT SO THAT APPROXIMATELY 1/8 OF THE DIAMETER OF THE ROOT BALL IS ABOVE THE FINAL GRADE.
8. BACKFILL PLANTING PIT WITH EXISTING SOIL.
9. MAKE SURE PLANT REMAINS STRAIGHT DURING BACKFILLING PROCEDURE.
10. NEVER COVER THE TOP OF THE BALL WITH SOIL. MOUND SOIL AROUND THE EXPOSED BALL.
11. TREES SHALL BE BRACED BY USING 2" BY 2" WHITE OAK STAKES. STAKES SHALL BE PLACED PARALLEL TO WALKWAYS AND BUILDINGS. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL. UTILIZING HOSE AND WIRE THE TREE IS BRACED TO THE STAKES.
12. BECAUSE OF THE HIGH LEVELS OF NUTRIENTS IN STORMWATER RUNOFF TO BE TREATED, BIORETENTION FILTER PLANTS SHOULD NOT REQUIRE CHEMICAL FERTILIZATION.

PLANTING GUIDELINES

PRIOR TO PURCHASING AND PLANTING ANY TREES, APPROVAL OF THE TREE SPECIES AND FINAL LOCATION SHALL BE APPROVED BY THE DIRECTOR FOR THE DEPARTMENT OF PARKS AND RECREATION OR AN APPROVED REPRESENTATIVE.

VARIABLE SPECIES: A MINIMUM OF THREE (3) SPECIES OF TREES SHALL BE SELECTED FOR THE BIORETENTION PLANTING AREA.

ALL TREES TO BE PLANTED SHALL MEET THE SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF NURSERYMAN.

THE PLANTING OF TREES SHALL BE DONE IN ACCORDANCE WITH EITHER THE STANDARDIZED LANDSCAPE SPECIFICATIONS JOINTLY ADOPTED BY THE VIRGINIA NURSERYMEN'S ASSOCIATION, THE VIRGINIA SOCIETY OF LANDSCAPE DESIGNERS, AND THE VIRGINIA CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS. OR THE ROAD AND BRIDGE SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION.

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

LANDSCAPE PLAN

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK – NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	1"=20'
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

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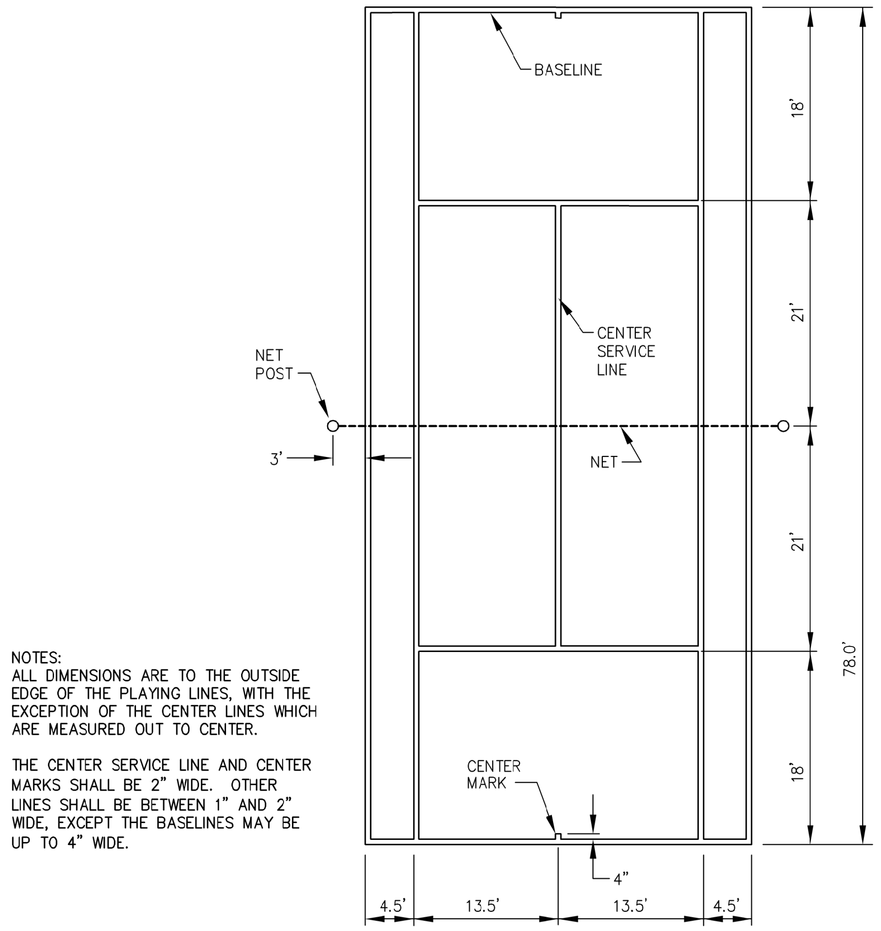
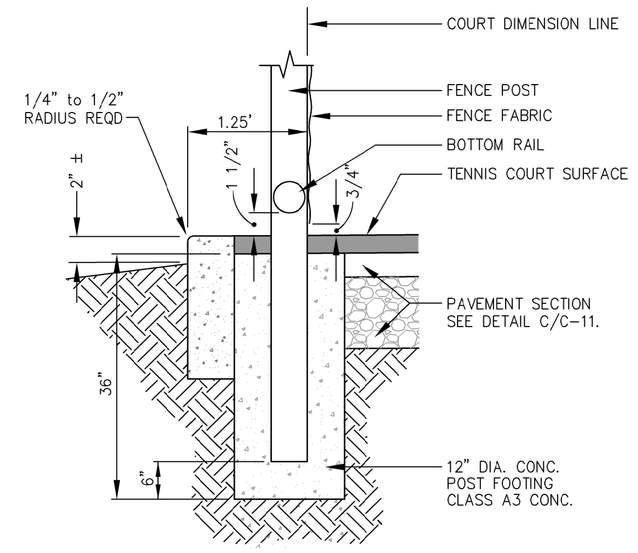


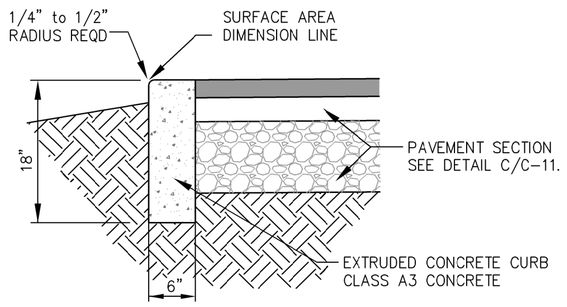
NOTES:
ALL DIMENSIONS ARE TO THE OUTSIDE EDGE OF THE PLAYING LINES, WITH THE EXCEPTION OF THE CENTER LINES WHICH ARE MEASURED OUT TO CENTER.

THE CENTER SERVICE LINE AND CENTER MARKS SHALL BE 2" WIDE. OTHER LINES SHALL BE BETWEEN 1" AND 2" WIDE, EXCEPT THE BASELINES MAY BE UP TO 4" WIDE.

A C–10 COURT STRIPING PLAN
NO SCALE

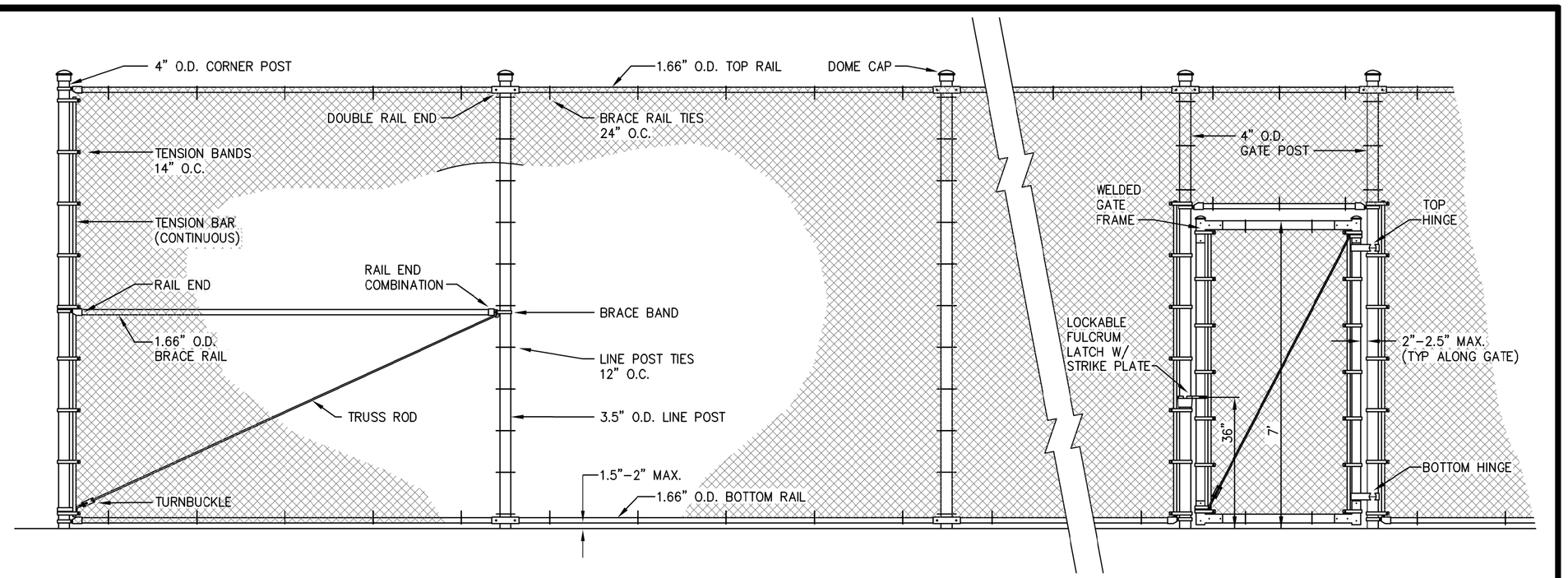


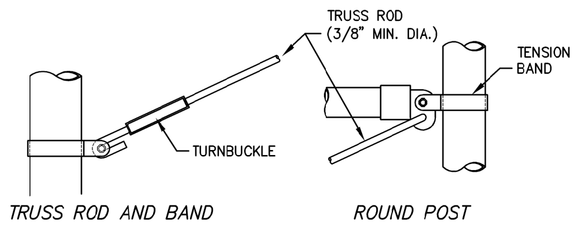
FENCE POST SECTION



STANDARD SECTION

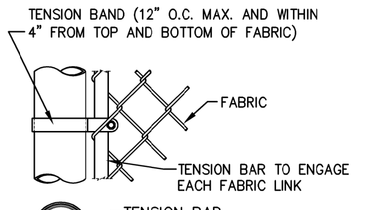
B C–10 PAVEMENT EDGING
NO SCALE



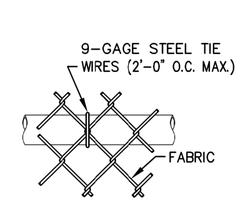


TRUSS ROD AND BAND

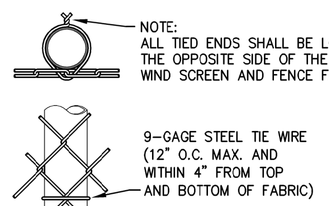
ROUND POST



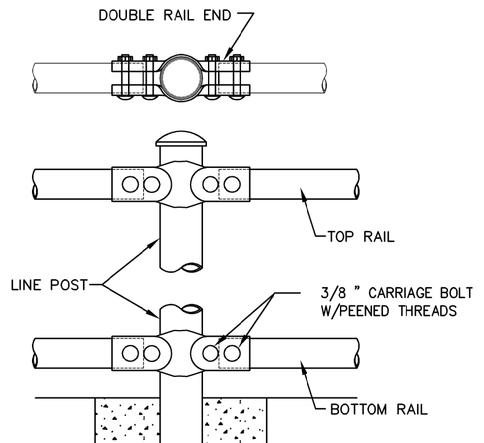
END OR GATE POST DETAIL



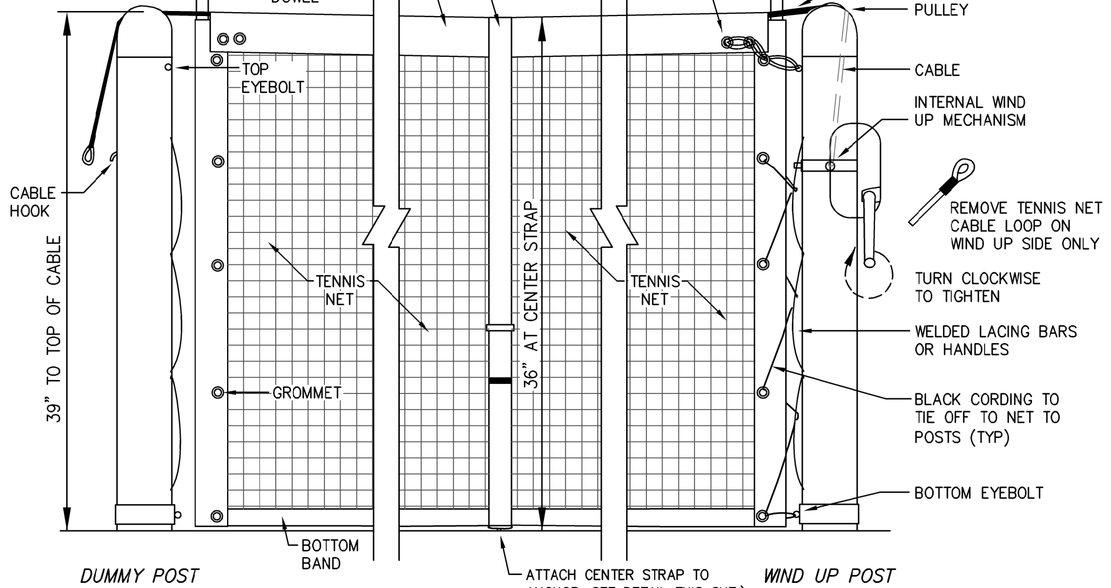
TOP, BOTTOM OR BRACE RAIL ATTACHMENT

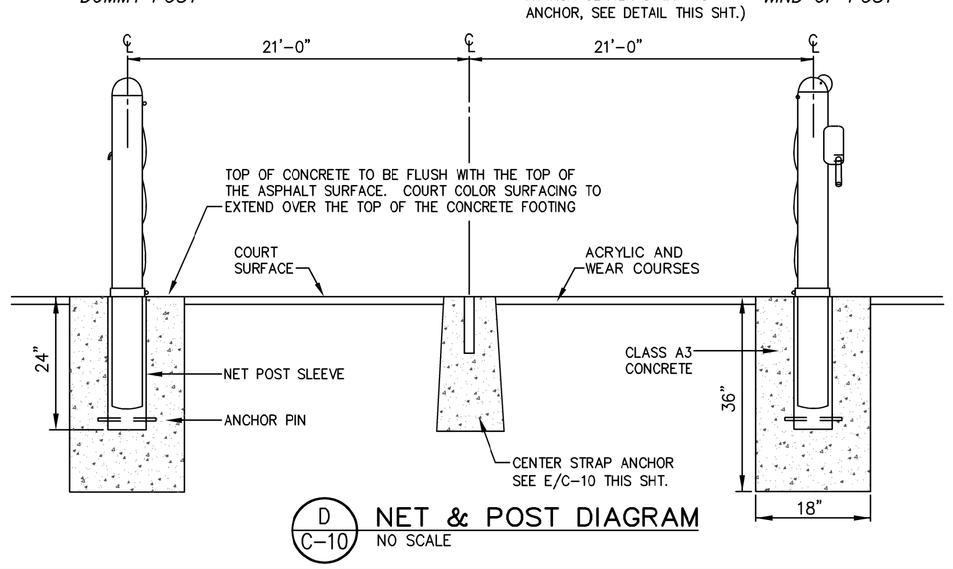


LINE POST ATTACHMENTS

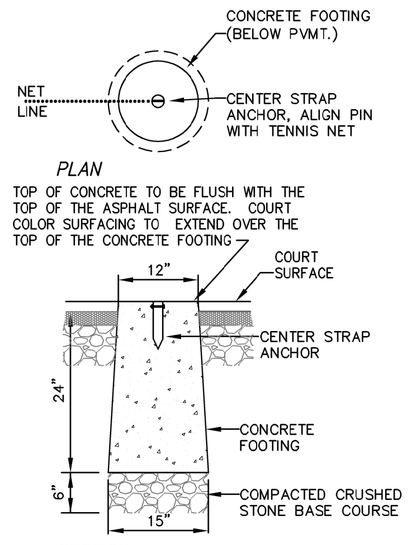


BOTTOM & TOP RAIL DETAILS





D C–10 NET & POST DIAGRAM
NO SCALE



PLAN

SECTION

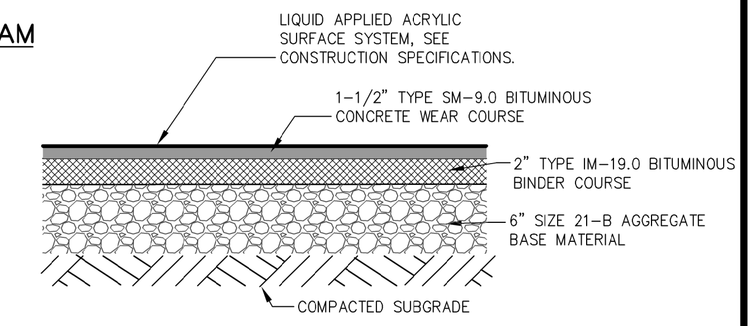
E C–10 TENNIS NET CENTER STRAP ANCHOR
NO SCALE

TENNIS COURT ACCESSORIES

PROVIDE MANUFACTURERS PRODUCT DATA PRIOR TO ACTUAL FIELD INSTALLATION WORK, FOR THE ENGINEER'S OR OWNER'S REPRESENTATIVE REVIEW AND APPROVAL. ALL MATERIALS AND INSTALLATION OF, SHALL COMPLY WITH THE UNITED STATES TENNIS ASSOCIATION STANDARDS & SPECIFICATIONS.

1. NET POSTS
   - A. NET POSTS SHALL BE MANUFACTURED FROM HEAVY–DUTY STEEL, ROUND, WITH A MINIMUM OUTSIDE DIMENSION OF 2 7/8 INCHES. NET POSTS SHALL NOT BE MORE THAN 6 INCHES SQUARE OR 6 INCHES IN DIAMETER.
   - B. POSTS SHALL BE FURNISHED WITH GALVANIZED NET POST SLEEVES AND ANCHOR PINS MANUFACTURED SPECIFICALLY FOR THE NET POSTS TO FIT TIGHTLY TO THE POSTS BUT ALLOW FOR POST REMOVAL AND REPLACEMENT AS NEEDED.
   - C. POSTS FOR EACH COURT SHALL BE FURNISHED WITH AN INTERNAL NET WINDER OR TENSIONER. THE TENSIONING MECHANISM SHALL BE OF HEAVY DUTY BRASS CONSTRUCTION WITH A LOCKING MECHANISM TO ENSURE PROPER NET TENSION.
   - D. POSTS SHALL BE POLYESTER POWDER COATED IN BLACK.
   - E. NET POSTS SHALL NOT STICK MORE THAN 1 INCH ABOVE THE TOP OF THE NET CORD.
2. TENNIS NET
   - A. COURT NETS SHALL BE CONSTRUCTED OF TWISTED BLACK WEATHER RESISTANT POLYETHYLENE NETTING. THE MINIMUM THICKNESS OF THE NETTING STRANDS SHALL BE 3.0 MILLIMETERS, 275 lb. MIN. TENSILE STRENGTH. THE NET SHALL HAVE A MAXIMUM OF 1 3/4" SQUARE MESH OPENINGS.
   - B. THE HEADBAND SHALL BE A POLYESTER QUADRUPLE STITCHED HEAVY–DUTY DOUBLE THICKNESS WITH A MULTI–STRAND GALVANIZED STEEL WIRE ROPE, MIN. DIA. 5/32 INCH, 2600 LBS. MIN. TENSILE STRENGTH. THE BAND SHALL BE COMPLETELY WHITE. THE BAND SHALL BE BETWEEN 2 INCHES AND 2.5 INCHES DEEP ON EACH SIDE. THE CABLE SHALL HAVE MECHANICALLY SPLICED DOUBLE LOOPS. GROMMETS SHALL BE NICKEL–PLATED BRASS, SPUR TYPE.
   - C. A MINIMUM OF THE TOP 5 ROWS OF NETTING SHALL BE DOUBLE MESH. THE SIDES AND BOTTOM EDGES OF THE NET SHALL BE FURNISHED WITH HEAVY–DUTY BLACK SYNTHETIC TAPE.
3. CENTER STRAP ANCHOR
   - A. THE GROUND ANCHOR SHALL CONSIST OF A 10–GAUGE GALVANIZED PIPE NOT LESS THAN 10 INCHES IN LENGTH AND 2 INCH IN DIAMETER WITH A STAINLESS STEEL PIN WITH A MINIMUM DIAMETER OF 1/4 INCH CENTERED THROUGH THE PIPE FOR THE PURPOSE OF ATTACHING A CENTER STRAP HOOK.
4. CENTER STRAP
   - A. THE MINIMUM WIDTH OF THE STRAP SHALL BE 2 INCHES. THE STRAP SHALL BE WHITE, NYLON WEBBING STRAP WITH ADJUSTING BUCKLE AND BOTTOM NON–CORROSIVE SWIVEL SNAP HOOK.
5. WIND SCREEN
   - A. WIND SCREENS SHALL BE INSTALLED AROUND THE PERIMETER FENCING AND ALONG ONE–SIDE OF THE CENTER FENCE LINE.
   - B. FABRIC SJHALL BE OPEN MESH POLYPROPYLENE, MINIMUM 75 PERCENT BLOCKAGE, WITH REINFORCING CENTER TAPE AND VINYL–COATED STEEL WIRE ROPE. REINFORCED HEMS AND BRASS GROMMETS SPACED AT 12 INCHES ON CENTER, TOP AND BOTTOM. HEIGHT SHALL BE 9 FEET, COLOR SHALL BE BLACK.
   - C. INSTALL WIND SCREENS ACCORDING TO MANUFACTURER'S RECOMMENDATION. ATTACH WIND SCREEN TO NYLON PERIMETER ROPE AND FENCE FABRIC WITH HEAVY DUTY PLASTIC CABLE TIES, LENGTH AS REQUIRED, COLOR SHALL BE BLACK.
6. INSTALL ALL APPURTANCES LISTED ABOVE IN CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS & RECOMMENDATIONS AND PER THE APPLICABLE DETAIL STANDARDS OF THE UNITED STATES TENNIS ASSOCIATION.
7. NO ADVERTISING IS ALLOWED ON THE COURT, NET, STRAP, BAND, NET POSTS EXCEPT AS PROVIDED BY THE UNITED STATES TENNIS ASSOCIATION.

C C–10 CHAIN–LINK FENCING DIAGRAM
NO SCALE



PAVEMENT COURSES SHOWN HEREON REFER TO VDOT SPECIFICATIONS, UNLESS NOTED.

THE SURFACE OF THE BASE STONE SHALL BE LEVEL WITHIN 1/4" WITH USE OF 10' STRAIGHT EDGE.

BASE SHALL BE APPROVED BY THE CITY FOR DEPTH, TEMPLATE AND COMPACTION BEFORE THE SURFACE MATERIAL IS APPLIED.

UPON INSTALLATION OF THE WEAR COURSE, THE ASPHALT SHALL BE ROLLED WITH A MINIMUM 8–TON ROLLER AND NO ROLLER RIDGES SHOULD BE SEEN UPON COMPLETION.

AFTER ASPHALT HAS SET, THE OWNER AND CONTRACTOR SHALL FLOOD THE COURTS AND INSPECT AFTER ONE–HOUR, AT 70 DEGREES F IN SUNLIGHT, IF THERE ARE ANY PONDS IN EXCESS OF 1/16–INCH IN DEPTH, G.C. SHALL CORRECT THE PONDING AREAS WITH APPROVED SEALER AND THE AREA RETESTED BY FLOODING.

F C–10 PAVEMENT SECTION
NO SCALE

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 May 15
PROFESSIONAL ENGINEER

CIVIL DETAILS

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION

PROPOSED TENNIS COURTS

SITUATE RIVERS EDGE PARK – NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
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murdock SINCE 1853

CONTEMPORARY DRINKING FOUNTAINS

GY Series

MODEL GYQ54
BI-LEVEL PEDESTAL MOUNTED
DRINKING FOUNTAIN WITH BOTTLE FILLER

Model GYQ55 Shown

STANDARD FEATURES

- Adult ADA compliant
- Pushbutton and hands free sensor operated bottle filler
- Battery pack 6AA
- Laminar flow water supply to bottle filler
- Resistant to sunlight, heat, moisture and wear
- 18 Gage, 304 stainless steel drinking Fountain bowls
- 12 Gage, heavy duty stainless steel construction with corrosion and scratch resistant finish
- Stainless steel, anti-rotation non-squirt bubbler
- *100 mesh inlet strainer*
- Access cover, heavy duty stainless steel, Vandal resistant

SUGGESTED SPECIFICATIONS

Barrier free, bi-level drinking fountain with bottle filler shall be Murdock model GYQ54. Construction shall be 12 gage, all stainless steel with 18 gage stainless steel fountain bowls. Pedestal shall have four mounting holes. Access covers shall be secured with vandal-resistant stainless steel screws. Bottle filler shall be activated by a 9 volt sensor or a pushbutton as standard. Unit shall contain a 100 mesh inlet strainer, lead and cyst filter, 6-AA battery pack and laminar flow spout. Self-closing push-buttons, needing less than 5 pounds force, shall activate internally mounted valves with adjustable stream regulators. Bubblers shall be stainless steel with non-squirt feature and operate on water pressure range of 20-105 psig. Unit shall conform to ANSI A117.1, 2010 ADA Standards for Accessible Design, ANSI/NSF 61- 9, CHSC 116875 and US Public Law 111-380

MODELS:

- ❑ GYQ54 Satin Stainless Finish
- ❑ GYQ55 Green Powder-Coated
- ❑ GYQ56 Red Powder-Coated
- [✓ ❑ GYQ57] Blue Powder-Coated

OPTIONAL ACCESSORIES

(additional costs may be incurred)

- ❑ - FRU3 Underground freeze-resistant for three valves (Pushbutton operation only, less filter) [1]
- [✓ ❑ - FRU4] Underground freeze-resistant for four valves (Pushbutton operation only, less filter) [1]
- ❑ - HB1 Hose bibb with vacuum breaker [1 2]
- ❑ - HB3 Vandal resistant hose bibb with vacuum breaker [1 2]
- ❑ - IAP In-ground anchor plate [1]
- ❑ - LOGO Customer specified logo [1]
- ❑ - MO Bottle filler operated by pushbutton only (Required for freeze-resistant valve)
- [✓ ❑ - PF] Pet fountain with push-button valve [1]

Option Notes:
[1] See separate option sheet
[2] This option is not available freeze-resistant

*Please visit **www.murdockmfg.com** for most current specifications.*

Member of U.S. Green Building Council · Recyclable Product · Water Conserving Product · Complies with the following standards: ANSI / NSF 61.9 · GREEN UPC · Federal Public Law 111-380 (No Lead)

MURDOCK MFG. • 15125 Proctor Avenue • City of Industry, CA 91746 USA
Phone 800-453-7465 or 626-333-2543 • Fax 626-855-4860 • www.murdockmfg.com

Member of MORRIS GROUP

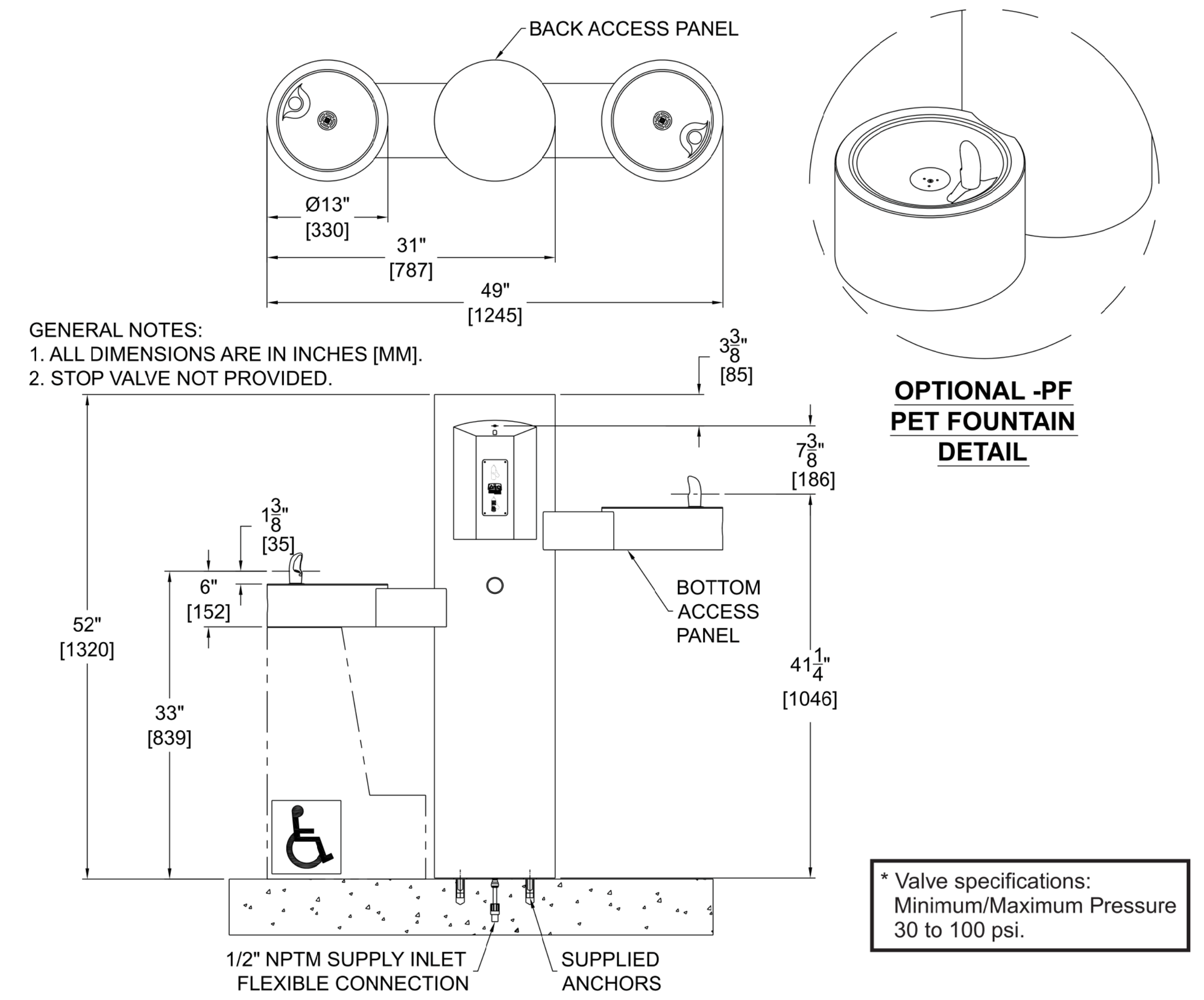
murdock SINCE 1853

CONTEMPORARY DRINKING FOUNTAINS

*All dimensions are subject to manufactures tolerance of plus or minus ½" nominal and subject to change without notice. Murdock Mfg. assumes no responsibility for use of void or superseded data. Dimensions may change with the addition of optional accessories. Murdock Mfg.™, Member of Morris Group International™. Please visit **www.Murdockmfg.com** for most current specifications.*

GY Series

MODEL GYQ54
BI-LEVEL PEDESTAL MOUNTED
DRINKING FOUNTAIN WITH BOTTLE FILLER



GENERAL NOTES:
1. ALL DIMENSIONS ARE IN INCHES [MM].
2. STOP VALVE NOT PROVIDED.

* Valve specifications:
Minimum/Maximum Pressure
30 to 100 psi.

Murdock Mfg.™ warrants that its products are free from defects in material or workmanship under normal use and service for a period of one year from date of shipment. Murdock's liability under this warranty shall be discharged solely by replacement or repair of defective material, provided Murdock™ is notified in writing within one year from date of shipment, F.O.B. Industry, California.

SELECTION SUMMARY & APPROVAL FOR MANUFACTURING

Model Number & Options__________ Quantity______
Company__________
Contact__________ Title__________
Signature (Approval for Manufacturing)__________ Date______

*All dimensions are subject to manufactures tolerance of plus or minus ½" nominal and subject to change without notice. Murdock assumes no responsibility for use of void or superseded data. Dimensions may change with the addition of optional accessories. Murdock Mfg.™, Member of Morris Group International™. Please visit **www.murdockmfg.com** for most current specifications.*

MURDOCK MFG. • 15125 Proctor Avenue • City of Industry, CA 91746 USA
Phone 800-453-7465 or 626-333-2543 • Fax 626-855-4860 • www.murdockmfg.com

Member of MORRIS GROUP

murdock SINCE 1853

-FRU FREEZE RESISTANT VALVE SYSTEM

INSTALLATION/MAINTENANCE INSTRUCTIONS

INSTALLATION INSTRUCTIONS FOR -FRU OPTION

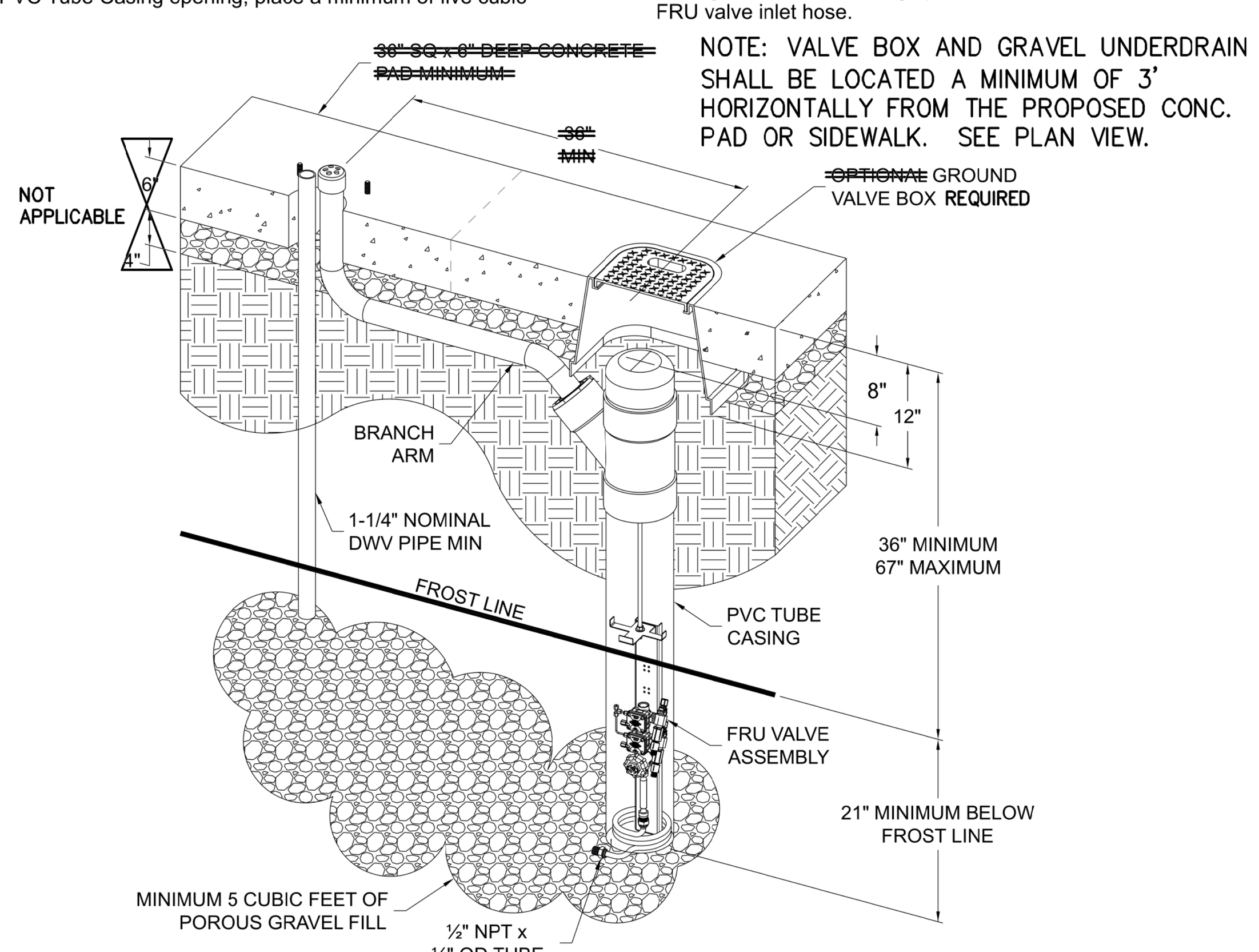
Important: Read all instructions and refer to local codes prior to installation.

Prepare trench for water supply line and waste line (if required) a minimum of 21" below frost line. At fountain location prepare hole to trench depth and large enough for a person to work. Provide 36" centerline of PVC Pipe Casing & FRU valve to fixture location. Lay supply and waste into trench allowing extra length to be trimmed during hook-up.

Depending on code and design requirements, drain may be open, French or sanitary connection. Under drain and PVC Tube Casing opening, place a minimum of five cubic feet of porous gravel fill. Local soil conditions may require more gravel for drainage.

- It is recommended to include a supply stop appropriately located on the supply line.
- An in-line PRV installed on the supply line is recommended to ensure a working water pressure of 40-60 psi.
- A water filter should be installed on the supply line if sediment or mineral content is a problem.
- A ½" NPT swivel elbow supply fitting below PVC Pipe Casing will assist in making up connections to the FRU valve inlet hose.

NOTE: VALVE BOX AND GRAVEL UNDERDRAIN SHALL BE LOCATED A MINIMUM OF 3' HORIZONTALLY FROM THE PROPOSED CONC. PAD OR SIDEWALK. SEE PLAN VIEW.



Valve Specifications:
Minimum/Maximum Pressure:
30/100 PSI

*Please visit **www.murdock.com** for most current specifications.*

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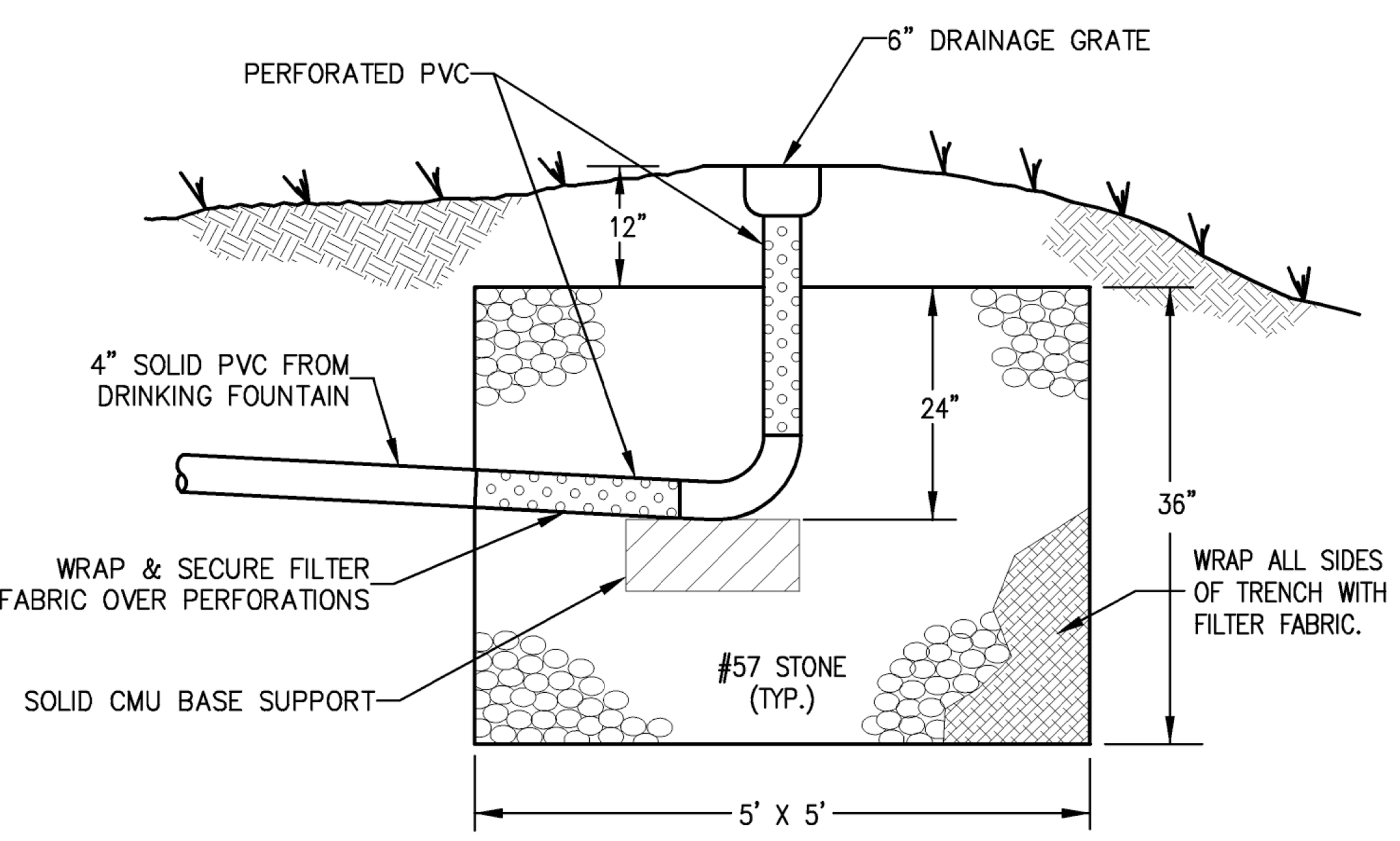
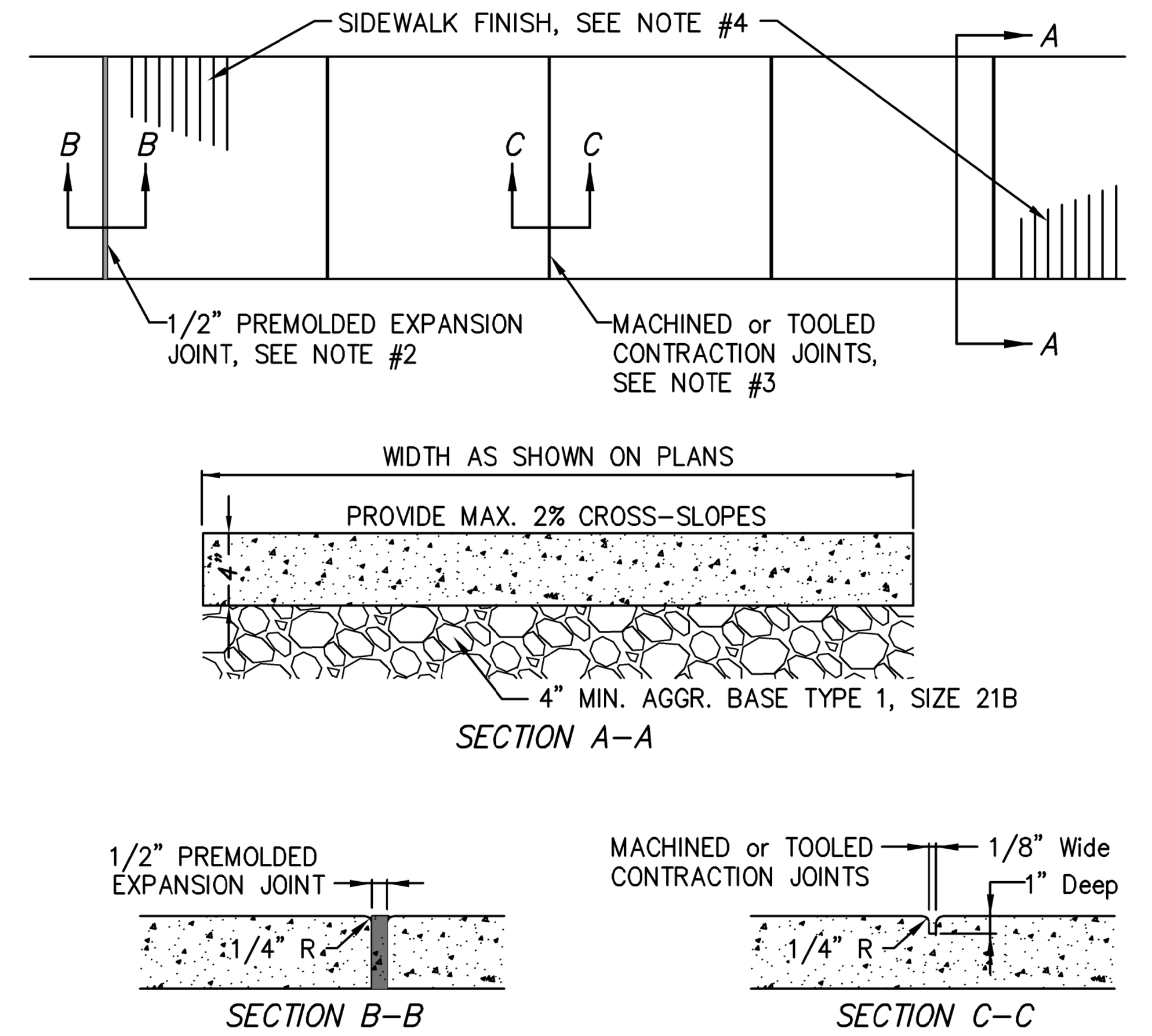


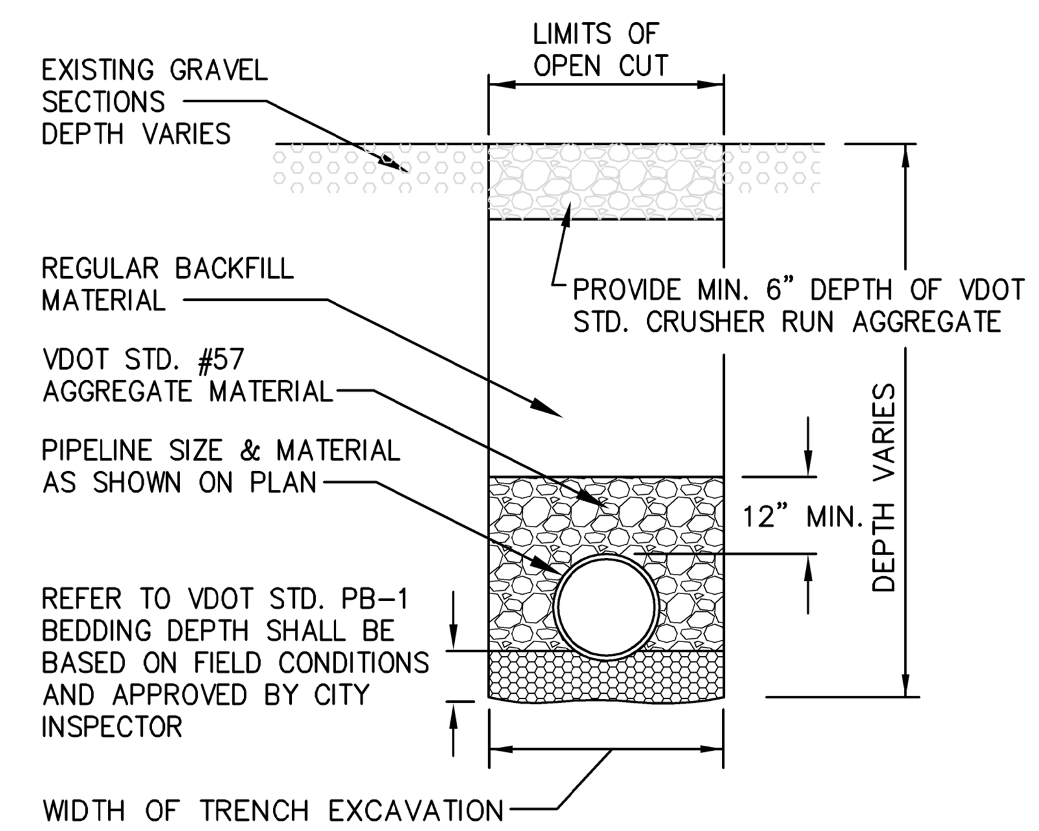
STONE DRYWELL W/SURFACE DISCHARGE

C / C-11 **WATER FOUNTAIN**
NO SCALE



NOTES:
1. ALL CONCRETE SHALL BE CLASS A3 GENERAL.
2. SPACING FOR EXPANSION JOINTS SHALL BE AT MAXIMUM 50' INTERVALS.
3. SPACING FOR MACHINED or TOOLED CONTRACTION JOINTS SHALL BE AT MAXIMUM 5' INTERVALS.
4. SIDEWALK FINISH SHALL BE SMOOTH TROWELED FIRST, THEN ENDING WITH A "LIGHT BROOM FINISH" IN THE DIRECTION OF THE CROSS SLOPE.
5. WHEN SIDEWALK ABUTS A CURBING OR PREVIOUS CONCRETE POUR, A 1/2" PREMOLDED EXPANSION JOINT IS TO BE USED.
6. CURING SHALL BE ACCOMPLISHED BY THE USE OF A LIQUID MEMBRANE SEAL CONTAINING WHITE PIGMENT, APPLIED AT THE RATE OF ONE (1) GALLON PER 150 SQUARE FEET.

A / C-11 **CONCRETE SIDEWALK**
NO SCALE



1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
3. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."

B / C-11 **UTILITY TRENCH RESTORATION**
NO SCALE

UTILITY NOTES

GENERAL:
A MINIMUM COVER OF THREE (3) FEET IS REQUIRED OVER PROPOSED LINES.

LINES SHALL BE STAKED PRIOR TO CONSTRUCTION.

CONTRACTORS SHALL NOTIFY UTILITIES OF PROPOSED CONSTRUCTION AT LEAST TWO, BUT NOT MORE THAN TEN WORKING DAYS IN ADVANCE. AREA PUBLIC UTILITIES MAY BE NOTIFIED THROUGH MISS UTILITY AT (800) 552-7001.

THE GENERAL CONTRACTOR SHALL COORDINATE ANY UTILITY CONSTRUCTION WITH THE GRADING, PAVING AND BUILDING CONTRACTORS AS REQUIRED TO MINIMIZE CONFLICTS.

ALL STORM DRAINAGE AND SANITARY SEWER WORK SHALL HAVE RIGHT-OF-WAY OVER ALL ELECTRICAL, WATERLINE, GAS AND TELEPHONE CONSTRUCTION.

IN ORDER TO MINIMIZE RUNOFF OF SEDIMENT LADEN WATER FROM UTILITY EXCAVATION THE CONTRACTOR SHALL OBSERVE THE FOLLOWING:
-NO MORE THAN 500 FT OF TRENCH SHALL BE OPEN AT ONE TIME.
-EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
-EFFLUENT OF DEWATERING SYSTEM MUST BE FILTERED.
-ALL BACKFILL SHALL BE PROPERLY COMPACTED TO 95% ASTM D-698, STD. PROCTOR.
-EXCAVATION AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY.

FINAL APPROVAL OF STORMWATER MANAGEMENT FACILITIES AND STORM DRAIN SYSTEMS

THERE ARE IMPORTANT STEPS YOU CAN TAKE WITH RESPECT TO SITE WORK THAT WILL HELP AVOID DELAYS IN FINAL APPROVAL:

- BEFORE MAKING FIELD REVISIONS, SUBMIT AN AMENDMENT TO YOUR COMPREHENSIVE DEVELOPMENT PLAN FOR REVIEW AND APPROVAL.
- ENSURE STORM DRAIN SYSTEMS ARE INSPECTED DURING INSTALLATION AND THE CONTRACTOR PERFORMING THE WORK IS ON THE CONTRACTOR/SUBCONTRACTOR LIST FOR THE PROJECT.
- ALL STORM DRAIN STRUCTURES AND LINES MUST BE FULLY OPERATIVE AND FREE OF DEBRIS.
- AN AS-BUILT OF THE STORM DRAIN SYSTEM AND STORMWATER MANAGEMENT FACILITY MUST BE PROVIDED FOR REVIEW AND APPROVAL. THE FIELD SURVEY MUST BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NA 83 IN THE FORM OF A PAPER COPY AND A DIGITAL AUTOCAD FILE.

GENERAL NOTES

COORDINATION WITH OWNER:
A) IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COORDINATE CLOSELY WITH THE OWNER RELATIVE TO PERMISSIBLE WORK HOURS AND DAYS.
B) UNLESS OTHERWISE SCHEDULED WITH THE OWNER IN ADVANCE, BUSINESS OPERATIONS AT THE ADJOINING FACILITIES MUST PROCEED AS NORMAL, AND UNIMPEDED.
C) CERTAIN HOURS OF THE DAY WILL BE MORE CONDUCIVE FOR CERTAIN CONSTRUCTION ACTIVITIES. WORK CLOSELY WITH OWNER TO SCHEDULE ALL ASPECTS OF CONSTRUCTION.

THE CONTRACTOR SHALL, TO ALL EXTENTS PRACTICAL, MINIMIZE THE PERIOD OF TIME WHICH THERE WILL BE NO ACCESS ACROSS THE EXISTING GRAVEL PARKING FACILITIES.

ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO THE CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE, VDOT, AND/OR THE WESTERN VIRGINIA WATER AUTHORITY, AS APPLICABLE.

AN APPROVED SET OF PLANS AND ALL PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.

CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AT THE JOB SITE.

NO CONSTRUCTION OR FIELD CHANGES WITHOUT PRIOR APPROVAL OF THE CONSULTING ENGINEER AND THE CITY OF ROANOKE DEPARTMENT OF PLANNING, BUILDING AND DEVELOPMENT.

LOCATION OF UNDERGROUND UTILITIES SHOWN ARE BASED ON FIELD SURVEYS, AS SHOWN BY AVAILABLE RECORDS AND AS LOCATED BY THE UTILITY LOCATOR SERVICE. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION.

THE SITE WORK AND LANDSCAPING CONTRACTOR(S) SHALL COMPLY WITH LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES, BOTH ON AND OFF THE SITE. REFER TO THE VIRGINIA UNIFORM CODING SYSTEM CONTAINED IN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, FOR DETAILS AND SPECIFICATIONS OF EROSION CONTROL ITEMS SHOWN ON THESE PLANS.

ALL PAVING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS. THE "PAVEMENT" DESIGN SHALL BE AS SHOWN HEREON.

EXISTING FENCING, UTILITY LINES OR OTHER PHYSICAL FEATURES THAT REQUIRE DEMOLITION SHALL BE REMOVED FROM THE SITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF ROANOKE. THE CONTRACTOR SHALL SAW-CUT ALL EXISTING FEATURES THAT ARE TO BE DEMOLISHED AND WHERE NEW CONSTRUCTION JOINS THE EXISTING.

CONSTRUCTION DEBRIS SHALL BE CONTAINED IN ACCORDANCE WITH THE VIRGINIA VIRGINIA LITTER CONTROL ACT. NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED ON-SITE.

COMMONWEALTH OF VIRGINIA
[illegible]
FRANK B. CALDWELL,III
LIC. NO. 9184
29 MAY 15
PROFESSIONAL ENGINEER

CIVIL DETAILS & NOTES

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION
PROPOSED TENNIS COURTS
SITUATE RIVERS EDGE PARK – NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	AS SHOWN
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE, N.W.
P.O. BOX 6260
ROANOKE, VIRGINIA 24017
(540) 366-3400
EMAIL: CWAROANOKE@AOL.COM

BIORETENTION SEQUENCE OF CONSTRUCTION:

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION FILTER. THE INSTALLATION OF A BIORETENTION FILTER WILL INCLUDE INTERMEDIATE INSPECTIONS AT CRITICAL STAGES OF CONSTRUCTION WITH INSPECTOR SIGN-OFF THAT THE PARTICULAR ELEMENTS OF THE BIORETENTION ARE CONSTRUCTED ACCORDING THE APPROVED PLANS AND SPECIFICATIONS. AS AN ALTERNATIVE, IF ALLOWED BY THE VSMP AUTHORITY, THE CONTRACTOR MAY RELY ON THE ENGINEER OF RECORD OR OTHER QUALIFIED INDIVIDUAL TO CONDUCT THE INTERMEDIATE INSPECTIONS AND CERTIFICATIONS OF COMPLIANCE. THESE STEPS MAY BE MODIFIED TO REFLECT DIFFERENT BIORETENTION APPLICATIONS OR EXPECTED SITE CONDITIONS:

STEP 1. CONSTRUCTION OF THE BIORETENTION AREA MAY ONLY BEGIN AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED WITH VEGETATION. IT MAY BE NECESSARY TO BLOCK CERTAIN CURB OR OTHER INLETS WHILE THE BIORETENTION AREA IS BEING CONSTRUCTED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.

STEP 2. THE DESIGNER AND THE INSTALLER SHOULD HAVE A PRECONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE CONTRIBUTING DRAINAGE AREA AND THE ACTUAL INLET ELEVATIONS TO ENSURE THEY CONFORM TO ORIGINAL DESIGN. SINCE OTHER CONTRACTORS MAY BE RESPONSIBLE FOR CONSTRUCTING PORTIONS OF THE SITE, IT IS QUITE COMMON TO FIND SUBTLE DIFFERENCES IN SITE GRADING, DRAINAGE AND PAVING ELEVATIONS THAT CAN PRODUCE HYDRAULICALLY IMPORTANT DIFFERENCES FOR THE PROPOSED BIORETENTION AREA. THE DESIGNER SHOULD CLEARLY COMMUNICATE, IN WRITING, ANY PROJECT CHANGES DETERMINED DURING THE PRECONSTRUCTION MEETING TO THE INSTALLER AND THE PLAN REVIEW/INSPECTION AUTHORITY.

STEP 3. TEMPORARY E&S CONTROLS ARE NEEDED DURING CONSTRUCTION OF THE BIORETENTION AREA TO DIVERT STORMWATER AWAY FROM THE BIORETENTION AREA UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE CONSTRUCTION PROCESS.

STEP 4. ANY PRE-TREATMENT CELLS SHOULD BE EXCAVATED FIRST AND THEN SEALED TO TRAP SEDIMENTS.

STEP 5. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT HAVE TO SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA. CONTRACTORS SHALL USE A CELL CONSTRUCTION APPROACH IN LARGER BIORETENTION FILTERS, WHEREBY THE FILTER IS SPLIT INTO 500 TO 1,000 SQ. FT. TEMPORARY CELLS WITH A 10-15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE.

STEP 6. IT MAY BE NECESSARY TO RIP THE BOTTOM SOILS TO A DEPTH OF 6 TO 12 INCHES TO PROMOTE GREATER INFILTRATION.

STEP 7. PLACE GEOTEXTILE FABRIC ON THE SIDES OF THE BIORETENTION AREA WITH A 6-INCH OVERLAP ON THE SIDES.

STEP 8. PLACE SOD ON THE PERIMETER OF THE PRE-TREATMENT CELL AND SURROUNDING BERM AS INDICATED ON INSERT 'A'. THE STABILIZATION OF THIS AREA IS REQUIRED PRIOR TO INSTALLATION OF THE SOIL MEDIA.

STEP 9. OBTAIN THE SOIL MEDIA FROM A QUALIFIED VENDOR, AND STORE IT ON AN ADJACENT IMPERVIOUS AREA OR PLASTIC SHEETING. THE CONTRACTOR SHALL SUBMIT THE BIO-MIX TO THE LOCAL VSMP AUTHORITY FOR APPROVAL. IT IS STRONGLY RECOMMENDED THAT THIS BE DONE IN THE EARLY STAGES OF THE PROJECT AS IT MAY REQUIRE MIX REVISIONS. AFTER VERIFYING THAT THE MEDIA MEETS THE SPECIFICATIONS, APPLY THE MEDIA IN 12-INCH LIFTS UNTIL THE DESIRED TOP ELEVATION OF THE BIORETENTION AREA IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT, AND ADD ADDITIONAL MEDIA, AS NEEDED, TO ACHIEVE THE DESIGN ELEVATION.

STEP 10. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION, AND WATER ACCORDINGLY. INSTALL ANY TEMPORARY IRRIGATION.

STEP 11. PLACE THE SURFACE COVER IN BOTH CELLS (MULCH, RIVER STONE OR TURF), DEPENDING ON THE DESIGN. IF COIR OR JUTE MATTING WILL BE USED IN LIEU OF MULCH, THE MATTING WILL NEED TO BE INSTALLED PRIOR TO PLANTING (STEP 9), AND HOLES OR SLITS WILL HAVE TO BE CUT IN THE MATTING TO INSTALL THE PLANTS.

STEP 12. INSTALL THE PLANT MATERIALS AS SHOWN IN THE LANDSCAPING PLAN, AND WATER THEM DURING WEEKS OF NO RAIN FOR THE FIRST TWO MONTHS.

BIORETENTION SOIL MEDIA REQUIREMENTS:

GENERAL FILTER MEDIA PHYSICAL COMPOSITION:

A. THE MINERAL SOIL TEXTURE OF THE BIORETENTION SOIL MIX SHOULD BE LOAMY COARSE SAND WITH NO MORE THAN 10% CLAY, NO MORE THAN 20% SILT + CLAY AND AT LEAST 75% OF THE SAND FRACTION SHOULD BE COARSE OR VERY COARSE SAND.

B. TO ALLOW FOR APPROPRIATE CATION EXCHANGE CAPACITY (CEC) AND NUTRIENT REMOVAL, THE MIX SHOULD CONTAIN AT LEAST 10% SOIL FINES (SILT + CLAY) WHILE MEETING THE OVERALL TEXTURE SPECIFICATION ABOVE. THE PARTICLE SIZE ANALYSIS MUST BE CONDUCTED ON THE MINERAL FRACTION ONLY OR FOLLOWING APPROPRIATE TREATMENTS TO REMOVE ORGANIC MATTER BEFORE PARTICLE SIZE ANALYSIS.

C. THE FILTER MEDIA SHOULD CONTAIN 3% TO 5% ORGANIC MATTER BY CONVENTIONAL WALKLEY-BLACK SOIL ORGANIC MATTER DETERMINATION METHOD OR SIMILAR ANALYSIS. SOIL ORGANIC MATTER IS EXPRESSED ON A DRY WEIGHT BASIS AND DOES NOT INCLUDE COARSE PARTICULATE (VISIBLE) COMPONENTS.

D. THE OVERALL PARTICLE SIZE DISTRIBUTION OF THE MIX WILL VARY SINCE THE SAND FRACTION MAY CONTAIN SOME FINER SIZES AS WILL NATIVE TOPSOILS IF UTILIZED. AS STATED PREVIOUSLY, THE GOAL OF THE MIXTURE IS TO ACHIEVE THE DESIRED CONSTANT HEAD PERMEABILITY. THEREFORE, THE FILTER MEDIA COMPOSITION NOTED ABOVE SERVES AS THE TARGET RECIPE FOR THE THREE INGREDIENTS, WHILE THE ULTIMATE PERFORMANCE GOAL IS TO ACHIEVE A VERIFIED SOIL PERMEABILITY OR HYDRAULIC CONDUCTIVITY (KSAT) OF 1 TO 2 INCHES PER HOUR (OR 30 TO 60 CM/DAY).

THE FOLLOWING IS THE RECOMMENDED COMPOSITION OF THE THREE MEDIA INGREDIENTS:

A. SAND SHALL CONSIST OF SILICA BASED COARSE AGGREGATE, ANGULAR OR ROUND IN SHAPE AND MEET THE MIXTURE GRAIN SIZE DISTRIBUTION BELOW. NO SUBSTITUTIONS OF ALTERNATE MATERIALS SUCH AS DIABASE, CALCIUM CARBONATE, ROCK DUST OR DOLOMITIC SANDS ARE ACCEPTED. IN PARTICULAR, MICA CAN MAKE UP NO MORE THAN 5% OF THE TOTAL SAND FRACTION. THE SAND FRACTION MAY ALSO CONTAIN A LIMITED AMOUNT OF PARTICLES > 2.0 MM AND < 9.5 MM PER THE TABLE BELOW, BUT THE OVERALL SAND FRACTION MUST MEET THE SPECIFICATION OF >75% BEING COARSE OR VERY COARSE SAND.

SIEVE	SIZE	% PASSING
3/8 IN	9.50 MM	100
NO. 4	4.75 MM	95 TO 100
NO. 8	2.36 MM	80 TO 100
NO. 16	1.18 MM	45 TO 85
NO. 30	0.6 MM	15 TO 60
NO. 50	0.3 MM	3 TO 15
NO. 100	0.15 MM	0 TO 4
EFFECTIVE PARTICLE SIZE (D10) > 0.3MM		
UNIFORMITY COEFFICIENT (D60/D10) < 4.0		

B. TOPSOIL IS GENERALLY DEFINED AS THE COMBINATION OF THE OTHER INGREDIENTS REFERENCED IN THE BIORETENTION SOIL MEDIA: SAND, FINES (SILT AND CLAY), AND ANY ASSOCIATED SOIL ORGANIC MATTER. SINCE THE OBJECTIVE OF THE SPECIFICATION IS TO CAREFULLY ESTABLISH THE PROPER BLEND OF THESE INGREDIENTS, THE DESIGNER (OR CONTRACTOR OR MATERIALS SUPPLIER) MUST CAREFULLY SELECT THE TOPSOIL SOURCE MATERIAL IN ORDER TO NOT EXCEED THE AMOUNT OF ANY ONE INGREDIENT. GENERALLY, THE USE OF A TOPSOIL DEFINED AS A LOAMY SAND, SANDY LOAM, OR LOAM (PER THE USDA TEXTURAL TRIANGLE) WILL BE AN ACCEPTABLE INGREDIENT AND IN COMBINATION WITH THE OTHER INGREDIENTS MEET THE OVERALL PERFORMANCE GOAL OF THE SOIL MEDIA.

C. ORGANIC MATTER MATERIALS USED IN THE SOIL MEDIA MIX SHOULD CONSIST OF WELL-DECOMPOSED NATURAL C-CONTAINING ORGANIC MATERIALS SUCH AS PEAT MOSS, HUMUS, COMPOST (CONSISTENT WITH THE MATERIAL SPECIFICATIONS FOUND IN VA DCR STORMWATER DESIGN SPECIFICATION #4 COMPOST SOIL AMENDMENTS), PINE BARK FINES OR OTHER ORGANIC SOIL CONDITIONING MATERIAL. HOWEVER, PER ABOVE, THE COMBINED SOIL MIX SHOULD CONTAIN 3% TO 5% SOIL ORGANIC MATTER ON DRY WEIGHT BASIS (GRAMS ORGANIC MATTER PER 100 GRAMS DRY SOIL) BY THE WALKLEY-BLACK METHOD OR OTHER SIMILAR ANALYTICAL TECHNIQUE.

AVAILABLE SOIL PHOSPHORUS (P):

PLANT-AVAILABLE SOIL P SHOULD BE WITHIN THE RANGE OF LOW+ (L+) TO MEDIUM (M) AS DEFINED IN TABLE 2.2 OF DCR (2005) VIRGINIA NUTRIENT MANAGEMENT STANDARDS AND CRITERIA. FOR THE MEHLICH I EXTRACTION PROCEDURE THIS EQUATES TO A RANGE OF 5 TO 15 MG/KG P OR 18 TO 40 MG/KG P FOR THE MEHLICH III PROCEDURE. THE FILTER MEDIA SHOULD CONTAIN SUFFICIENT PLANT AVAILABLE P TO SUPPORT INITIAL PLANT ESTABLISHMENT AND PLANT GROWTH, BUT NOT SERVE AS A SIGNIFICANT SOURCE OF P FOR LONG TERM LEACHING. THE MEDIA MUST ALSO BE RELATIVELY LOOSE AND NON-COMPACTED TO ALLOW FOR ADEQUATE INTER-CONNECTED POROSITY TO MEET THE REQUIRED PERMEABILITY (KSAT) SPECIFICATION. SAXTON ET AL. (1986) ESTIMATED GENERALIZED BULK DENSITIES AND SOIL-WATER CHARACTERISTICS FROM SOIL TEXTURE ASSUMPTIONS. THE EXPECTED BULK DENSITY OF THE LOAMY SAND SOIL COMPOSITION DESCRIBED ABOVE SHOULD BE IN THE RANGE OF 1.6 TO 1.7 G/CM3.

CATION EXCHANGE CAPACITY (CEC):

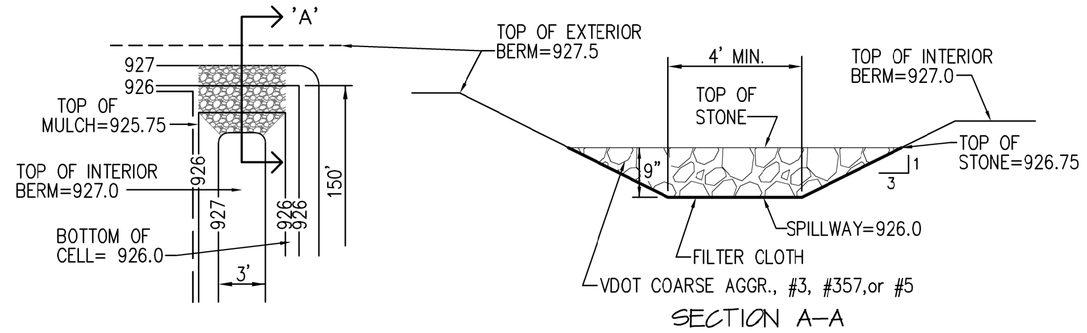
THE RELATIVE ABILITY OF SOILS TO HOLD AND RETAIN NUTRIENT CATIONS LIKE CA AND K IS REFERRED TO AS CATION EXCHANGE CAPACITY OR CEC AND IS MEASURED AS THE TOTAL AMOUNT OF POSITIVELY CHARGED CATIONS THAT A SOIL CAN HOLD PER UNIT DRY MASS. CEC IS ALSO USED AS AN INDEX OF OVERALL SOIL REACTIVITY AND IS COMMONLY EXPRESSED IN MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100G) OF SOIL OR CMOL+/KG (EQUAL VALUES). A SOIL WITH A MODERATE TO HIGH CEC INDICATES A GREATER ABILITY TO CAPTURE AND RETAIN POSITIVELY CHARGED CONTAMINANTS, WHICH ENCOURAGES CONDITIONS TO REMOVE PHOSPHORUS, ASSUMING THAT SOIL FINES (PARTICULARLY FINE SILTS AND CLAYS) ARE AT LEAST PARTIALLY RESPONSIBLE FOR CEC. THE MINIMUM CEC OF A BIORETENTION SOIL MEDIA MIX FOR POLLUTANT REMOVAL IS 5.0 (MEQ/100 G OR CMOL+/KG) OR GREATER. THE FILTER MEDIA CEC SHOULD BE DETERMINED BY THE UNBUFFERED SALT, AMMONIUM ACETATE, SUMMATION OF CATIONS OR EFFECTIVE CEC TECHNIQUES (SUMNER AND MILLER, 1996) OR SIMILAR METHODS THAT DO NOT UTILIZE STRONGLY ACIDIC EXTRACTING SOLUTIONS. COATINGS OF FE- AND AL-OXIDES ON MINERAL SOIL SURFACES ARE ALSO RESPONSIBLE FOR SIGNIFICANT P RETENTION AND MAY BE PRESENT IN SOILS WITH LOW CEC. THUS, IT IS IMPORTANT FOR FILTER MEDIA P REMOVAL EFFICIENCY THAT SOME AMOUNT OF MINERAL FINES (10% - 20%) BE PRESENT AS LONG AS THE TEXTURE AND PERMEABILITY SPECIFICATIONS CITED HEREIN ARE MET. THIS IS IMPORTANT DUE TO THE FACT THAT SOIL ORGANIC MATTER PER SE IS NOT ACTIVE IN ADSORPTION OF P. THE CEC OF THE SOIL IS DETERMINED IN PART BY THE AMOUNT OF CLAY AND/OR HUMUS OR ORGANIC MATTER PRESENT. SINCE THE BIORETENTION MEDIA IS A COARSE MINERAL TEXTURE, AND SINCE THE ADDED ORGANIC MATTER MAY NOT HAVE THE RELATIVELY HIGH CEC OF NATIVE HUMUS, IT MAY BE DIFFICULT TO ACHIEVE THE IDEAL CEC FOR THE MIXTURE AS A WHOLE IN FRESHLY BLENDED MATERIALS. HOWEVER, IT IS EXPECTED THAT OVER TIME, NATURAL ACCUMULATION OF ORGANIC MATTER WILL IMPROVE SOIL REACTIVITY. THEREFORE, THE INITIAL MEDIA MIXTURE MAY REQUIRE ADDITIONAL SUITABLE ORGANIC MATTER TO INCREASE THE CEC TO THE EXTENT POSSIBLE WITHOUT OVERLY COMPROMISING THE FILTER MEDIA COMPOSITION OR ELEVATING THE AVAILABLE P.

FILTER MEDIA PERMEABILITY:

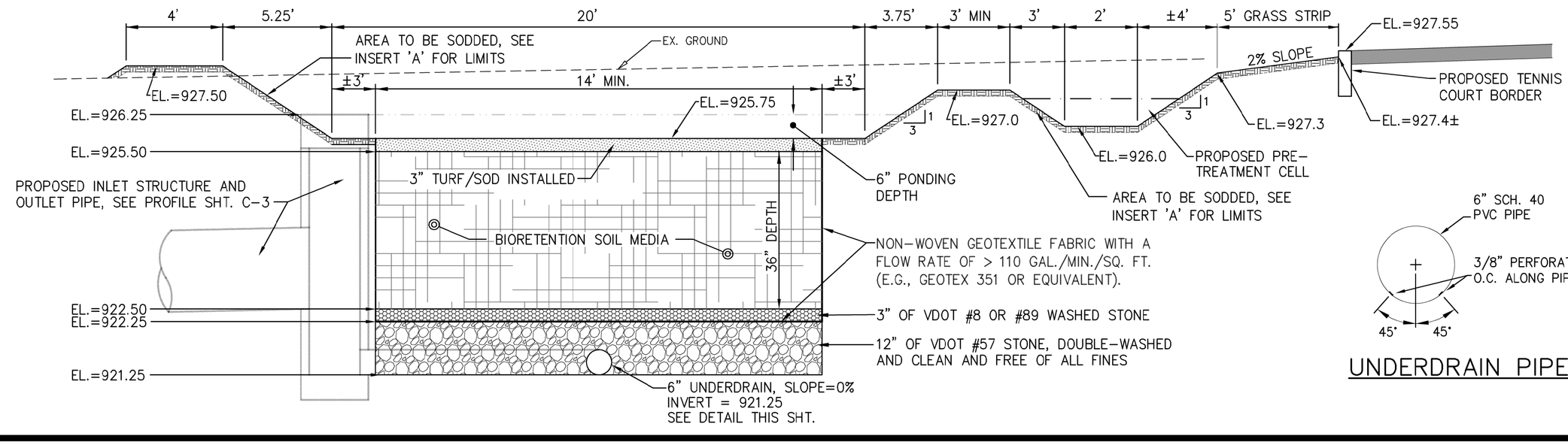
THE BIORETENTION SOIL MEDIA SHOULD HAVE A MINIMUM INFILTRATION RATE OF 1 TO 2 INCHES PER HOUR (OR 30 TO 60 CM/DAY). NOTE: A PROPER SOIL MIX WILL HAVE AN INITIAL INFILTRATION RATE THAT IS SIGNIFICANTLY HIGHER.

BIORETENTION FILTER DESIGN CRITERIA - LEVEL 2

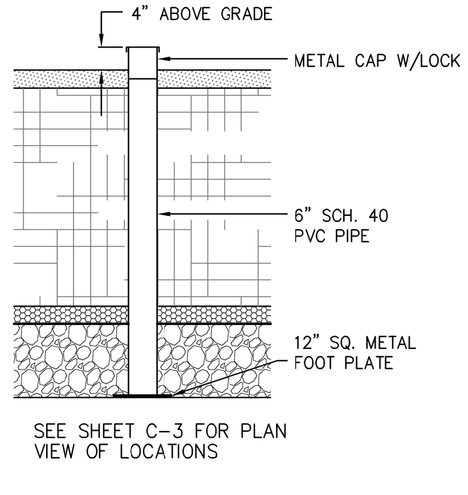
CRITERIA -	COMPLIANCE OR RESPONSE -
SIZING: TVBMP = [(1.25)(RV)(A) / 12]	TV REQUIRED = 3,128 CF , TP REMOVAL RATE REQD. = 1.68 lb/yr
SURFACE AREA = TVBMP / STORAGE DEPTH	SURFACE AREA REQUIRED = 1,895 SF , DESIGNED AREA PROVIDED = 2,075 SF
MAXIMUM CONTRIBUTING DRAINAGE AREA = 2.5 ACRES	DRAINAGE AREA TREATED = 1.06 ACRES, TP REMOVAL RATE = 1.76 lb/yr
MAXIMUM PONDING DEPTH = 6 TO 12 INCHES	DESIGNED PONDING DEPTH = 6"
FILTER MEDIA DEPTH: MINIMUM = 36 INCHES MAXIMUM = 48 INCHES	DESIGNED FILTER MEDIA DEPTH = 36"
MEDIA & SURFACE COVER: SUPPLIED BY VENDOR; TESTED FOR ACCEPTABLE HYDRAULIC CONDUCTIVITY (OR PERMEABILITY) AND PHOSPHORUS CONTENT.	REFER TO SOIL MEDIA REQUIREMENTS THIS SHEET
SUB-SOIL TESTING: ONE SOIL PROFILE AND TWO INFILTRATION TESTS PER FACILITY (UP TO 2,500 SF OF FILTER SURFACE); MIN INFILTRATION RATE > 1/2 INCH/HOUR IN ORDER TO REMOVE THE UNDERDRAIN REQUIREMENT.	REFER TO APPENDIX B, ENGINEERING CALCULATIONS INFILTRATION RATES < 1/2 INCH/HOUR. THEREFORE AN UNDERDRAIN IS PROVIDED.
UNDERDRAIN & UNDERGROUND STORAGE LAYER: SCHEDULE 40 PVC WITH CLEAN OUTS, AND A MINIMUM 12-INCH STONE SUMP BELOW THE INVERT; OR, NONE, IF SOIL INFILTRATION REQUIREMENTS ARE MET.	REFER TO DETAIL THIS SHEET AND PLAN VIEW ON SHEET C-3.
INFLOW: SHEETFLOW, CURB CUTS, TRENCH DRAINS, CONCENTRATED FLOW, OR THE EQUIVALENT	ALL SOURCES OF INFLOW IS VIA SHEETFLOW
GEOMETRY: LENGTH OF SHORTEST FLOW PATH/OVERALL LENGTH = 0.8; OR, OTHER DESIGN METHODS USED TO PREVENT SHORT-CIRCUITING;	143' / 150' = 0.95
PRE-TREATMENT: A PRETREATMENT CELL PLUS ONE OF THE FOLLOWING: A GRASS FILTER STRIP, GRAVEL DIAPHRAGM, GRAVEL FLOW SPREADER, OR ANOTHER APPROVED (MANUFACTURED) PRE-TREATMENT STRUCTURE.	5' GRASS FILTER STRIP TO A PRE-TREATMENT CELL, THROUGH A GRAVEL DIAPHRAGM.
CONVEYANCE & OVERFLOW	GRATE INLET AND OUTLET PIPE ARE DESIGNED TO CONVEY THE 10-YEAR STORM.
PLANTING PLAN: A PLANTING TEMPLATE TO INCLUDE TURF, HERBACEOUS VEGETATION, SHRUBS, AND/OR TREES TO ACHIEVE SURFACE AREA COVERAGE OF AT LEAST 90% WITHIN 2 YEARS. IF USING TURF, MUST COMBINE WITH OTHER TYPES OF VEGETATION.	REFER TO THE LANDSCAPE PLAN, SHEET C-9 MEDIA COVER WILL UTILIZE A TURF AND TREES WMULCH AND TURF BED TEMPLATE.
BUILDING SETBACKS: 10 FEET IF DOWN-GRADIENT FROM BUILDING OR LEVEL (COASTAL PLAIN); 50 FEET IF UP-GRADIENT.	THE CLOSEST BUILDING IS APPROXIMATELY 300' UP-GRADIENT
DEEDED MAINTENANCE O&M PLAN:	PROPOSED BIORETENTION IS LOCATED WITHIN THE CITY OF ROANOKE PARKS AND RECREATION JURISDICTION.



GRAVEL SPILLWAY & PRETREATMENT CELL



UNDERDRAIN PIPE



SEE SHEET C-3 FOR PLAN VIEW OF LOCATIONS

OBSERVATION WELL

COMMONWEALTH OF VIRGINIA
FRANK B. CALDWELL, III
LIC. NO. 9184
29 MAY 15
PROFESSIONAL ENGINEER

BIORETENTION FILTER DETAILS

CITY OF ROANOKE

DEPARTMENT of PARKS and RECREATION

PROPOSED TENNIS COURTS

SITUATE RIVERS EDGE PARK - NORTH
RESERVE AVENUE, SW
ROANOKE CITY, VIRGINIA

Designed:	J.V.J.
Drawn:	J.V.J.
Checked:	F.B.C.
Revised:	5/29/15
Scales:	AS SHOWN
Tax Parcel:	1040202
N.B. No.:	RKE CITY #10
W.O. No.:	14-0061

CWA
CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
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